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GOAL-POSTS AND YARDSTICKS IN HEALTH CENTER WORK *

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ORGANIZED WORK for health and even for sanitation, on a small-district basis, is new. How far do old-established objectives and foot-rules apply as the unit of activity is shifted from the community to the neighborhood?

ACTIVITIES CANNOT BE LABELED

A review of the activities actually conducted in organizations known as health centers in the United States and Canada, and of the forms of their organization, shows plainly that a health center cannot be defined in terms of any specific list of activities, or by the kind of its organization, nor yet by the nature of its physical plant. We find health centers, as in Cleveland and New Haven, offering forms of health service almost wholly preventive in nature. More often some curative services mingle with the preventive, as in Boston, Buffalo, and many other cities; while in Des Moines; Halifax; Alameda County, California; and some centers in New York City, a wide variety of both preventive and curative services is offered. On the basis of observation and experience, labels such as "preventive," "curative," "health," "medical," and the like, should not be applied to services as arguments either for or against their inclusion within the program of a health center. The sound basic considerations are the needs of a district and the availability of various services rendered by agencies already existing and by private medical practice.

As to form of organization, we find health centers which are purely local units, under a single board; other local units which are complex federate bodies; and still others of a type in which a city-wide organization, private or municipal, administers a chain of local centers. It is hence impossible to specify a particular form of organization for a health center, centralized or federative. A review of the situation shows again that organization must conform to local conditions, and cannot be prescribed *a priori*. The extent to which a federate form of organization, pooling the interests of a number of existing agencies for the common service of an agreed-upon area, and the degree to which welfare agencies not in the health field shall participate in the organization and activities of the health center, are examples of questions of this type, which for the present at least should be worked out on a pragmatic basis.

As to buildings, we find everything from rented stores or reconstructed houses to plants especially constructed for health center purposes; from parts of

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settlement buildings used as health centers to parts of a hospital out-patient department assigned to the same use.

WHAT IS A HEALTH CENTER?

Observation of a large number of health centers leads to an indication of two factors which all those studied appear to present: first, the selection of a definite district, or of a population unit, with the aim of serving all therein who need the services offered; second, coördination of services within this area, embracing both the facilities furnished by the health center itself and those provided by other agencies. A definition might therefore be stated as follows:

A health center is an organization which provides, promotes, and coördinates needed medical* service and related social service for a specified district.

THE CLINIC AND THE HEALTH CENTER

During recent years there have grown up, not only clinics doing preventive work under health department auspices, but many small clinics unattached to hospitals, generally doing preventive rather than curative work. These are sometimes preschool or dental clinics under the auspices of a local organization like a settlement or a church—sometimes baby welfare stations or prenatal clinics under the health department or a private city-wide organization. A few do chiefly curative medical work. In New York City there are now about 250 unattached clinics, counting all types, nearly all established within the past fifteen years, and a large proportion within the last ten.

The size of the individual units is small, often so small as to raise the query whether such tiny clinics are worth serious attention, but their importance cannot be measured in terms of attendance. The real significance of the recent rapid growth of the unattached clinic is that it has been a service station, and still more an experiment station, in *health* service, or in other words, in the application of preventive medicine to the individual. This is the field in which the leaders of public health now generally believe the great future of both official and voluntary health work to lie. The problems and technic of dealing with the material environment for the purpose of sanitation have been largely mastered and reduced to administrative routine. The problems ahead in constructive health work are those which involve the hygienic guidance, instruction, education, or reëducation of the individual. The reduction of infant and maternal mortality, the healthy and wholesome development of children in body and mind, the application of existing knowledge to control of tuberculosis, venereal disease, heart disease, cancer, and the degenerative diseases and chronic illnesses of middle and later life, involve the community as well as individual factors, but will depend primarily upon success in rendering health service to individuals.

The unattached clinic in New York City and throughout the country has been the chief institution in or through which the methods, technic, and policies of this health service have been, and still are being, worked out. They have provided the centers in which the physicians have worked upon the problems, and the centers from which the public health nurse and the social worker have found their point of departure and their door of approach to the people.

These forms of health service could not in the past and, even at the present time cannot usually develop in conjunction with the hospital. The emphasis upon curative work in the hospital and the out-patient department is inevitable. While much preventive medicine can be applied to the individual in the early stages of disease in the out-patient department, and during the convalescent period in both out-patient department and hospital, and while the tendency to introduce educa-

* This term is used in the broad sense to include either preventive or curative work.

tional and preventive methods into these aspects of curative medicine is increasing, it remains true that the temper of the medical and other personnel in the hospital and the out-patient department and the character of its organization and procedure are adapted primarily to dealing with sick persons. It is well to encourage the establishment in out-patient departments of special clinics for children or adults in those branches of health service, particularly tuberculosis, venereal, or cardiac clinics, in which the health services must be rendered via the diagnosis, treatment, or supervision of a disease. The hospital and its out-patient department thus have their place, and probably a growing place, in the scheme of health service. But we must still look to the unattached clinic as the special field for the advancement of health service to the individual, in so far as this is not taken over into private medical practice.

The need of localization is another reason for the unattached clinic. Proximity to a neighborhood is essential in order to reach its population intensively for some forms of health service. Districting is desirable for the maximum economy of time and energy both of clients and of clinic personnel, primarily the nursing and social work. The location of hospitals and the out-patient departments immediately connected with them must be determined by other considerations than those of local health service; hence in any districting plan certain areas may often require some clinics or health centers, located apart from hospitals. There are many reasons why it is desirable for hospitals to be away from the more congested, noisy and smoky sections of the city. Branch out-patient departments are practicable, though not as yet in favor, and these will probably play a future part in conjunction with the growth of district health centers—but that lies in the future. The unattached clinic, in one form or another, must be utilized as an agent through which organized health service can be brought to all the sections of a community which need it.

THE PLACE OF CLINICS UNATTACHED TO HOSPITALS

Study of unattached clinics has shown that the purely local clinics usually find it difficult to get and retain satisfactory personnel, or to secure the professional supervision necessary to keep personnel up to standard. The local units maintained by city-wide organizations are better off in these respects. A review of this situation in New York City has led to several lines of recommended policy and to what might be called a city health center program. Clinics for the diagnosis and treatment of disease can as a rule be most efficiently and economically conducted as the out-patient department of a hospital. There is, however, as just stated, a place for unattached clinics offering health service and various forms of preventive medicine, especially baby welfare work, prenatal work, health examinations and health guidance of young children, mental hygiene, and preventive dentistry. Such unattached clinics should be grouped and coördinated into local health centers serving each a definite area. There is a place also for special unattached clinics supplying what may be called intramural health service to the clients or members of a particular organization or institution, an industrial establishment, a school, or a settlement, for example; but the bulk of unattached clinics should be associated as health centers.

From one point of view, a health center thus represents a combination of a number of clinics with one another and with other public health and social services of or for the district. The isolated clinic dealing with only a single branch of preventive or therapeutic work has serious limitations from the medical standpoint. When drawn into a health center it loses many of these disadvantages. When

clinics are located in the same building they are of mutual assistance. A combination under one roof, for example, of baby welfare and prenatal clinics, with perhaps some services to preschool or school children, enables the medical and non-medical personnel of the clinics to coöperate to mutual advantage, and also saves time of patients and increases the weight and influence of the health service in the district. If there are also in the same building, for instance, a tuberculosis, a cardiac, and a dental clinic, still larger opportunities are opened up for the mutual interplay between the clinics in their medical aspects and the mutual stimulation of their working personnel. Various coördinations in the medical, educational and social case work with patients and families come about naturally through the personal contacts among the specialized personnel of different clinics, even when these clinics are under separate organizations. The opportunity to provide needed professional supervision is much greater than if the clinics are in isolated units in independent buildings and under independent jurisdiction. In Halifax, the main health center is physically associated with the out-patient department of a hospital and with an important medical teaching center, so that the whole range of institutional medical practice is provided. But in a city already as well provided with hospitals and out-patient departments as most sections of New York (the Borough of Queens and parts of Brooklyn and Bronx might be mentioned as examples of metropolitan areas thus served), the health center would ordinarily not need, and the New York health centers have ordinarily not provided, therapeutic services beyond those which seem especially called for by neighborhood needs.

NURSING AND SOCIAL SERVICE

From another point of view, the public health nursing and social services, which are performed largely in the homes, are the outstanding consideration in organizing health service on a district basis. In many instances they are more important than the clinics. From a broader standpoint, the work in the clinics and the work in the homes are two aspects of the same task, which should be intimately related.

There are also activities like nutrition demonstrations, lectures, conferences, local publicity, health movies, and other forms of generalized health education, which are neither clinic work nor home service, though they again should be closely related. The heart of health center work, the reason for the existence of health service on a local basis, is obviously health service to individuals, or, as it may be called, "health case-work," for which localization provides more intensive opportunities, and of which clinics, public health nursing, and social service are three chief forms. Mass service is often a useful and necessary supplement to the work with individuals.

PROBLEMS OF HEALTH CENTER TECHNIC

The correlation of the medical services with the nursing and social services rendered in connection with a center presents a variety of problems. The fact that social agencies often keep their records on a family basis creates technical problems of comparisons between their work and that of the clinics, whose records are usually kept on an individual basis. Another problem is the correlation of the field work done by nurses or social workers with the work of the clinics. In the typical out-patient department or unattached clinic all of the home nursing or social service is directly related to the medical work of the clinic, and is under the same administrative direction as the clinic itself. Even in this case the correlation of the home work with the work of the clinic is not always easy. When, however, one agency is in charge of the clinic and another of the field work, complications are increased and home service may not bear a sufficiently intimate relation to the medical problems

revealed in the clinic. On the other hand, the clinic work may be conducted without proper utilization of the information about the patient's personality and home conditions, secured in the home contacts by nurse or social worker.

Within the last decade or so, out-patient departments (particularly in the teaching hospitals) have passed out of the stage in which each subdivision or specialty was a unit by itself, and have attained a condition in which a central record system aids a unified medical and social service organization in dealing with each patient as a whole. Health centers of the federate type have a more difficult problem of organization to solve than the out-patient department has had, but they face the same objective, and the necessity for steadfast effort towards its attainment is the same. The principle of a unified record system, now generally accepted as desirable in the hospital world, cannot be applied in detail to the health center in exactly the same fashion as to the hospital and the out-patient department; but the fundamental principle that the records concerning a given patient or family should be filed together and centrally indexed has application to any organization or group of organizations which has various departments dealing with the different medical and social problems of the same individual.

Although the usual records of a federate type of health center present a technical problem similar to that of the different clinical and social services of an out-patient department, the situation is complicated administratively by the fact that many of the records may be under diverse agencies whose interrelations are far looser than those of the clinics in an out-patient department. The best service to the client, however, would render it desirable, first, to concentrate all the records of the different clinics and, second, to associate as closely as possible with these the nursing or social records pertaining to the same person. Economy and convenience would be promoted by having all the files in a single room, from which records could be distributed to the agencies as needed. This would insure much more expert filing and better statistical control. Combination in a single room is, of course, possible without putting all the records of a given individual in a single folder. It is certainly to be desired that a central record room be specified in planning new centers, and that physical centralization, at least of all medical records, be effected.

Whatever the record system, a central alphabetical index is essential if the number of individuals served is to be known, as well as the interrelations of services to these individuals. Each card will show, as in the out-patient department, the identifying information regarding the patient. This will be filed under his name, and will indicate all the clinics, agencies, or departments he has attended, with the date of his first admission. The entire range of services to any client can thus be ascertained through the index, and all his records can be assembled at any time, whether or not a central record room is maintained. The alphabetic index is also essential in determining the number of individuals reached by each service and by the center as a whole, in comparing these numbers with the population of the district or any subdivision, and in analyzing the number and types of services rendered to persons in various age, sex, or race classifications. Without a good central index, a health center is seriously handicapped in securing quantitative data regarding its own work.

A center also needs quantitative data of another kind, namely, vital statistics concerning the area served. Health departments do not always report mortality, morbidity, births, and so forth, according to local areas, but the tendency in health work is strongly toward this. In using such data, care should be taken that the figures in the subclassifications are sufficiently large to furnish a satisfactory

statistical foundation. The use and interpretation of such statistics are referred to below.

HEALTH CENTER ORGANIZATION

Underlying these and many other questions of technic are questions of policy. To some of these questions neither practical experience nor prophetic vision has yet provided an answer. But framing a question is sometimes like the general's choosing of his ground—it is half the battle.

How many health centers or demonstrations have defined their objectives, or at least rigorously stated the questions of policy with which they are to wrestle?

What is meant by "coördination"? In practice, it has as much or as little meaning as the coördinatees choose to put into it. Obviously, it begins in friendliness, and obviously, it is promoted by proximity. This was demonstrated at the Blossom Street Health Unit in Boston fifteen years ago. The question to-day has shifted to more advanced ground: how far does coördination mean centralized administration? The question which the United States has had for one hundred and fifty years, as between the federal government and the states, the health center now has between itself and its constituent agencies.

How far, in determining their policies or programs of work in the district, shall the constituent agencies in a federate health center be obligated to consult their fellow-members?

How far shall the federate government of the health center be given authority to determine policies and programs?

What functions are appropriate or necessary for direct administration by the federate authority?

Is a central clearing house for cases, or a generalized nursing system for the district, desirable as a goal, and if so, how much does the achievement of the goal depend upon administrative centralization?

Is a central record system a desirable objective?—if so, must it be under a centralized administration?

Is a central index a necessary activity, and is it also, like the United States Post Office, a necessary activity of a central government?

This throws us back on a more fundamental question: If coördination is one of the aims of the health center, is federate organization the means of achieving coördination? Any federate form of organization is admittedly clumsy from the standpoint of administration; yet in some districts where many existing agencies are at work, the federate form may seem the only possible one. But, if created, what shall be its objectives?—economy, through the saving of overhead in building or supervision?—economy, through saving effort by joint program making and by dovetailing of work?—efficiency, in rendering larger service with the same staff? Economy and efficiency are obviously among the tests of accomplishment; *how much*, is the real question.

No federate health center has yet grappled hard enough, or perhaps long enough, with this question, to tell us on the basis of experience whether the federate type of district organization can achieve efficiency as well as good-will. Unless federate types of organization can annually demonstrate definite steps forward in joint program making, in common services, in dovetailing of the staffs of different organizations for joint service when common service is not desirable—unless these and similar manifestations of effectively advancing administration can be shown, the future of the federate type of health center would seem doubtful.

HEALTH CENTER OBJECTIVES

Beside these questions of organization, arises the broader question of the adaptation of the objectives of the health center to the needs of its particular district. The problem faced in Alameda County, California, which must cover the needs of

new but highly developed urban communities as well as those of the small towns and rural areas of a great county, is wholly different from that of the North End of Boston or the City of Buffalo. The needs of the population and the types of locally existing agencies affect profoundly the kinds of service which a health center will include within a given district. The Des Moines Health Center has had to establish many forms of curative work, side by side with preventive work, in order to meet otherwise unmet needs, whereas in the East Harlem district of Manhattan most of the curative needs were already taken care of by existing agencies before the health center was established. In new communities the field may be comparatively clear of existing agencies. In old cities like Boston, or in the Bellevue-Yorkville district in New York, existing agencies are legion, and their interrelations with one another and with local health services constitute a problem in themselves. Such questions arise as these:

If there is a diminishing resident population, will service limited to this population be an adequate aim for the health center or demonstration?

If there is a large daytime population, which works in the district but sleeps elsewhere, how far is service to this large group a legitimate and perhaps necessary aim of a health center which has selected such a metropolitan area?—and by what tests could the results of such service be measured?

If in a health center's area there is a network of health and welfare agencies, many of which may serve the whole city, how far is the stimulation and coördination of their activities an appropriate aim of the center, transcending though such an aim does the interests of the district itself?

Again, how far is organization of the people of a district themselves a practical means of promoting the services at the center, and of advancing health education throughout the district? Experience shows great value in a loose local organization of agencies interested in medical or health work, in education, especially public and parochial schools, and neighborhood and recreational bodies. On the other hand, the attempt to organize the people of a district into a local council, with or without block workers, has generally yielded little result in proportion to the effort expended. The reasons for this difficulty lie deep in the characteristics of American neighborhood life, whether among native or foreign born. Health work is also a highly technical service, still in the experimental stage, and it cannot be carried forward by individuals without specialized knowledge and training.

TESTS OF ACHIEVEMENT

Determining objectives which fit the local situation and devising tests of accomplishment will be as challenging as any work of a health center or demonstration.

In an experimental type of work, such as health centers still are, tests of accomplishment are of paramount significance. How far does improvement in the mortality and morbidity statistics of a local district constitute a test of achievement for the health center? Or would apparent failure to show such improvement be an evidence of the failure of the work? Is there sufficient experience in the collection and interpretation of local statistics to answer these questions?

Some forms of health work, such as infant welfare service, have demonstrable and fairly immediate effects upon mortality. On the other hand, there are newer forms, like dental hygiene or periodic health examinations, in which the effect upon mortality or even upon morbidity is not yet capable of statistical measurement. Will not any rigorous application of the tests of vital statistics as ordinarily used become increasingly difficult as the point of view and the character of the work done shift in emphasis toward the promo-

tion of positive health as distinguished from the prevention of definite disease or its relief or cure? Tests for the newer types of work may have to be more delicate and of longer range. The effect of periodic health examinations in promoting longevity might require a twenty-year period for its appraisal. Shall we have sufficient faith in its value to keep it going meanwhile? Or can shorter-range tests of its worth be devised, such as the number of diseases and defects found among various age and sex groups and the proportion cared for or corrected?

Aside from these statistical tests, there are administrative foot-rules and tests to be applied to the work of the health center as to other forms of health service. Services rendered may be recorded and measured by bulk, as the number of persons served, of home or clinic visits, treatments or consultations, and be related in some instances to the population potentially needing the service. Work done may also be recorded and measured according to the kinds of services rendered, problems dealt with, number of each kind, and results or disposition of cases. Several agencies are now experimenting with "problem-and-service codes" as a technic for such means of self-estimation. Almost every form of technical work turns up certain data on critical points, periodical comparison of which furnishes some basis for judgment of work and accomplishment. The proportion of advanced, or moderately advanced, tuberculosis cases sent to sanatoria, the percentage of communicable syphilis cases rendered noncommunicable, the increases in weight of children in a nutrition service, are illustrations. Such indices must be applied with care and interpreted with caution, especially when comparisons between different clinics or different health centers are attempted. The financial elements, factors of expenditure and of cost, furnish another area from which measures or indices must be derived.

In order to frame sound criteria and to devise accurate and economical means of utilizing them, the administrator and the vital statistician must work together. There should be joint thinking as well as post-operative conferences. The practical arts of health, as well as its science, must devise new measuring-sticks as they proceed to new functions.

SPRAY COATING PROCESSES *

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FIELD STUDIES of the use of spray coating equipment by industry in the State of Pennsylvania were begun in June, 1925, and continued to the early spring of 1926. They were followed by and supplemented with laboratory studies on air currents and conditions at a spray booth erected in the engineering department of the University of Pennsylvania and also by animal experimentation, using the gassing chambers devised by Katz and Yandt of the Bureau of Mines.

Field work included physical examinations of 340 employes spraying lacquers, paints, varnishes, shellacs, substitute shellacs and stains and vitreous enamels—the examination embracing medical and working history, heart and lung examination, blood pressure, red and white blood cell counts, hemoglobin determination, differ-

* Abstract of the Report of a State-Wide Investigation of Spray Coating Processes. Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-fifth Annual Meeting at Buffalo, N. Y., October 14, 1926.

ential white cell counts and urine examination. In addition to the above, air samples were taken for benzol, where lacquer, varnish or stain was being sprayed, for lead where paints or enamels were being sprayed, and for solid particles, where the material sprayed was vitreous enamels.

Relative humidity determinations were made with the sling psychrometer, and also air currents as moving past the face of the sprayer were measured with the aid of the Kata thermometer.

RESULTS OF TESTS

These tests showed a definite correlation between air velocity and content of vapors and solids; the frequent presence in the air breathed by lacquer sprayers of benzol vapors averaging around 100 p.p.m., but in some cases as high as 2,000 p.p.m. The presence of measurable amounts of lead in the air even where the lead content of the material sprayed was as low as 1 per cent, and where vitreous enamel was being sprayed Palmer sample counts ran from 80,000 quarter unit particles up to over 190,000,000.

Air measurements at the spray booth ranged from zero up to over 400 feet per minute, but averaged well under 100 feet per minute.

NO CASES OF BENZOL OR LEAD POISONING

No cases of acute poisoning from benzol or lead were encountered, but histories of such were occasionally obtained and sprayers not infrequently showed the effects of their exposure. There usually was a rather definite correlation between evident degree of exposure to the toxic substances in question as judged by air motion and air content, and physical condition and blood findings of the sprayer. No high benzol contents were observed with air velocities of 150 feet per minute, and no Palmer counts as high as 1,000,000 were obtained with velocities of over 115 feet per minute unless objects were sprayed standing up to act as baffles, throwing the spray towards the operator.

Experimental spraying where air velocity, gun pressure and benzol content of lacquer were under control showed that high benzol contents of air were at times obtained in spite of good exhaust ventilation with 10 per cent benzol lacquer. But with lacquer containing under 1 per cent benzol, no high benzol air tests were obtained with air velocities under 125 feet per minute. Velocities under 100 feet gave air tests for benzol as high as 235 p.p.m., even with lacquer containing no added benzol.

The first evidence of benzol absorption by the sprayer was seen in a primary stimulation of red and white blood cell formation followed by a steady decline in white cell count and an early change in the differential counts with a relative lymphocytosis due to decrease of polymorphonuclears followed by an absolute lymphanemia. Curves are presented and graphs showing characteristic blood changes observed.

This investigation will form the basis of regulations governing spray painting in Pennsylvania. It was made preliminary to further field studies conducted during the summer of 1926 for the National Safety Council by the author and his assistants.

DR. VICTOR C. VAUGHAN LECTURER OF KOBER FOUNDATION

DR. VICTOR C. VAUGHAN, Fellow A.P.H.A., formerly professor of hygiene and physiological chemistry and dean of the Medical School, University of Michigan, gave the Kober Foundation Lecture at Georgetown University, Washington, D. C., March 28. Dr. Vaughan's subject was "The Chemistry of Living Substances and Its Adaptability to its Environment."

As lecturer of the Kober Foundation Dr. Vaughan represented the Medical Corps of the U. S. Army, Navy and Public Health Service and the AMERICAN PUBLIC HEALTH ASSOCIATION.

VALUE AND USE OF HEALTH DEPARTMENT BULLETINS *

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NO ONE going into a business to-day would dream of not getting his product before the public in the accepted way, and the business man charges his advertising to overhead expenses.

It doubtless will be conceded that one of the important functions of a health department is informing and educating the public in health matters, in other words giving publicity to these important subjects.

In Chicago we believe that the purpose of our bulletin is to sell public health in a simple way, and on that basis we are trying to publish our bulletin.

About four years ago we determined to change the policy of publishing our bulletin. We endeavored to find a pattern. We believe that it is necessary to pattern activities to a certain degree after the successful plan of other endeavors. In public health, generally some genius finds a way and the others follow. In this case we have endeavored to follow. We patterned our weekly bulletin after what we agreed were the two outstanding pieces of literature—the Lord's Prayer, and the greatest speech known to-day, particularly in America, Lincoln's Gettysburg Address.

Practically everybody knows the Lord's Prayer. It is easily remembered, mainly because it is short, simple, and made up of one or two syllable words. The same is true of Lincoln's Gettysburg Address. It was on the principle of making a bulletin short, easily understood, "peppy" and "snappy" that we adopted the plan of the Chicago Health Department Bulletin.

APPEAL TO AVERAGE MENTALITY

The average adult in a city as large as Chicago, has little or no knowledge of public health. After a day's work and after reading ordinary newspaper literature, his brain is pretty well fagged. You cannot impress him with technical terms, embodied in long sentences and embellished with big words. You must give him simple ideas of health to be understood by one with the mental age of about 12 years.

Next, we considered the attractiveness of our publication and decided that a health bulletin should have pictures. It should have appealing pictures. The newspapers to-day, whose circulation is increasing by leaps and bounds in the United States, are the newspapers that are adding more and more pictures. In other words, like old Doan, we believe that "every picture tells a story." He used psychology when he advertised his kidney pills.

Now, if you people will just look at the next dozen or two of illustrated bulletins that you receive you will be impressed by another point which we think is of vital importance. I do not believe that there has come over our desk one baby bulletin that did not have scattered throughout its pages, two or three or four dozen times, a picture of a stork perched on one leg holding a baby. Here is a scientific organization trying to convince children and adults that a lanky stork, weighing 8 or 9

* Presented to the Public Health Administration Section of the American Public Health Association at the Fifty-fifth Annual Meeting at Buffalo, N. Y., October 11, 1926.

pounds, is able to carry a baby through the air and dish it out that way. Why health authorities will use that kind of an argument, when it is definitely unscientific, I do not know. I presume there is hardly a popular magazine publishing articles on baby care that does not have a picture of a beautiful baby sucking his thumb. Then some place in the article you are warned not to let the baby suck his thumb. I firmly believe that pictures should be truthful and that license should not be taken by artists in making beautiful pictures to take away from them definite and positive health teachings.

USE RIGHT KIND OF ADVERTISING

We believe that it pays to advertise and we also believe that we should use the right kind of advertising. Last evening I went to the news stand and picked up this copy of the *Pictorial Review*. I did not have to pick up this particular copy, for any magazine tells the same story. Here is an advertisement from the man who paid the highest income tax in the United States last year, William Wrigley, Jr., and here is a half page "ad" by the second largest advertiser in the world to-day: "A hint to mothers—appetite, digestion and health: all derive benefit." The keynote of this advertising is health.

Here we have another "ad" entitled "Gee, Mother, but you're pretty." It reads: "In his heart every boy wants to think this of his mother. Give him the right to do so by safeguarding your youth in this simple manner—what? Palm Olive Soap!" And when mother sees that she goes out and gets Palm Olive. Here is another full page "ad" about H. M. Victoria Eugenie, Queen of Spain, which tells all about her beauty, her pale golden hair, eyes of malachite blue, and so forth, and her expression of the desire for Pond's Creams. It states that of all the creams she has used she attributes her great beauty most to Pond's Face Cream. Now this is the secret of becoming beautiful. The advertiser is hooking up royalty with beauty. What do you suppose the little shop girl is going to do when she wants to obtain beauty? Seek fresh air and exercise? No. She will spend a dollar for a jar of something to rub on her face, and get beauty from the outside in, instead of from the inside out. And here is the "punch"—if you wish to be beautiful you must first have at least 8 hours of sleep every day and also each day you must eat lettuce, celery, cabbage, spinach, carrots, white turnips, oranges and tomatoes. Your doctor will tell you what combinations to use—and also, use Ingraham's milkweed cream for your complexion! Here is another "ad": "Do you wish your children to be healthy?" Do what? Fresh air and exercise? No—Cream of Wheat every morning for breakfast and Cream of Wheat is good. Here is one telling how to keep a child warm! "The real warmth that comes from within—Shredded Wheat"—not clothes.

I am simply referring to these "ads" to show how commercial firms that are spending millions of dollars in advertising are winning by capitalizing health. These "ads," by the way, also help public health.

We know that it pays to advertise. I made that statement not long ago in the city of Chicago, apropos of a sign I saw one day on my way to a speaking engagement. We think that we have in Chicago probably the greatest public utility genius in the world to-day—Samuel Insull. From a shoe-string he has developed properties worth millions of dollars. He advertises the electric light, the elevated road and gas. Not long ago he had a large sign erected in all sections of Chicago advertising gas. He said, "You can do it better with gas." We checked back on statistics in the Health Department 6 months later, and found definitely that it did pay to advertise—because 246 more

people committed suicide by gas that year than the year before. Yes, it does pay to advertise.

Some people may think that we are becoming a bit unethical. Is it permissible for health officers to advertise? Let me call your attention to an editorial in the October 9 issue of the *Journal of the American Medical Association* by Dr. Morris Fishbein, one of the outstanding men of the medical world today. In it he says: "Publicity is permitted to men not in practice and to officials in departments of health as not only desirable but necessary for the fulfillment of their official duty."

Newspapers not only welcome that kind of material, but are willing to pay for it. In the city of Chicago a booklet was written entitled "Our Babies," and the Chicago *Daily News* paid $5,000 for the privilege of running that 64-page booklet. The *Woman's World* paid $1,500. That convinces us that there is a definite need for public health publicity and that the newspapers will pay for it.

Another thing we do in Chicago is to publish a weekly news brief. This news brief is translated into 9 foreign languages. We find in offering it to the foreign newspapers that the editors are keen to have the articles translated for them. So we have a man in our department who translates these news articles for the foreign language papers which reach a circulation close to a million every month.

We believe that a bulletin should be "snappy," and at the same time should be dignified. Bulletins should contain timely topics of public interest. Around election time there should be a bulletin on "Health Primaries" in which the voters ballot for Mr. Fresh Air, Mr. Exercise and Mr. Rest. During the crossword puzzle fad we got out a bulletin on "Crosswordits" that was effective. This bulletin brought in hundreds of clippings.

We talk positive health. The basis of all our bulletins is fresh air, exercise, sleep and the proper kind of food. The titles of the bulletins also add interest. Nothing is attracting more attention than the Wet and Dry issue, and so one of our bulletins carries this: "As Commissioner of Health I am wet, and I am solemnly behind the Wet Movement." That will attract attention. Everybody who believes in religion and is unalterably opposed to drinking will say, "What the devil is the matter with that man?" The wets will say, "That is fine stuff." As we go along we say of course we are wet, that we believe in drinking, we believe everybody ought to drink at least 10 or 12 glasses of water a day to wash the toxins out of the system. Here we are stealing a thought that is uppermost in the public mind.

Our bulletin has a circulation of 25,000. Recently, when the list was 2 years old, we sent out a postal card to every one of the 25,000 persons saying, "Unless you reply, your name will be taken from the mailing list." We did not make it easy for them. We made it hard by saying that if they wanted the bulletin they must put forth a little effort. More than 90 per cent replied that they wished to continue receiving the bulletin.

Perhaps sometimes we have been criticised for the simple manner in which we prepare the bulletin, and for the pictures we use. But people want pictures. Too, they do not want to read a long dissertation. If you can send out a snappy bulletin, with interesting stuff, from week to week, you will be able to sell public health just as Lydia Pinkham and all the others of that group were able to sell their stuff.

DISCUSSION

F. J. Osborne, East Orange, New Jersey—In general, it may be said that the value of a public health bulletin depends entirely upon what is in it; and that its use is conditioned by the audience to whom it is directed.

In this day of high-powered advertising, beautiful illustrating, and expensive composition and display, nobody should attempt a bulletin designed to market public health unless he is in a position to apply these various arts and talents in his own promotion scheme. Dry tales of personal hygiene can be enlivened and made real by appropriate illustrations either by cartoon or photograph, and whether it be by the one or the other depends to a great extent upon the personal taste of the editor and the availability of the instrument. Anybody can learn to use a camera. Good cartoonists are rare. In the same way, the useful truths about communicable diseases, sanitation, and the rudiments of sanitary engineering can be not only written about but can be pictured in a way to make them stick in the memory. There is no good argument against entertaining while we instruct and much of our effort will be futile unless the emotions are aroused.

There are two common uses of department reports. One is the house organ type used by some state boards of health to stir up local health officers, to orient them accurately with reference to advances in public health, and to supply them with instructions for organizing their work as well as with information for general distribution. The other type might be called a sales sheet, prepared in a more popular vein and illustrated as described above with the idea of having both text and pictures talk to the unintiated, in a confidential though authoritative way. The printing of either type of bulletin is relatively inexpensive, but the time and ability of the editor are far more costly whether the material circulated is good or poor.

DISTRIBUTION OF BULLETINS

Much has been said about the distribution of public health bulletins. This will be limited largely by one's budget. If but a small edition can be printed, care should be taken that they get into the hands of the community leaders, heads of organizations, physicians, lawyers, leading merchants, school principals, and others who can and will largely influence public opinion and support health department activities. If the number of copies is not limited, then a general mailing list may be used, although probably other more effective methods of distribution can be worked out which will make the circulation more personal. In order to reach all those desired, a combination of mail and personal distribution through organized groups should be made.

Before the problem of distribution is reached, however, the question whether to publish a health bulletin must be met. It must be accepted in the beginning that once this task is undertaken, it calls for continuity, a constantly fresh viewpoint and interesting presentation, and that it requires both time and some degree of special ability. There are two reasons why we in East Orange have not up to date entered upon this project. It has seemed that more vital administrative affairs, or at least more immediately emergent ones, have commanded most of the time of the health officer, and there has been nobody else available for the preparation and editing of such material. If the time of the health officer and others as well as the printing cost were totaled, $75 for a monthly issue of 1,000 copies is the lowest possible estimate at which such work could be done. This means $900 a year, or 1 per cent on a $90,000 budget, or 2 per cent on $45,000 which is perhaps more nearly that of the 50,000 population city. It is a very grave question, therefore, whether in the face of other essential health needs an expenditure of this size can be justified, and it is also probable that if such a bulletin is adequately illustrated by clever cuts, inserts, and photographs, that the total cost would be more nearly $100 per issue, certainly if enough copies were printed to cover the population adequately.

It can, therefore, be accepted that this kind of service, if properly carried on, is expensive, and we all are indebted to the American Public Health Association in its recent proposal, first worked out and suggested by Dr. Raymond S. Patterson of the New Jersey State Department of Health, whereby expertly prepared material is being syndicated and supplied to health departments at a nominal cost. It must be admitted by all who judge fairly that this syndicated health bulletin of the A.P.H.A. edited by John Hall is far more attractive and interest-compelling than the great majority of so-called health bulletins which cross one's desk in the course of a month. Being made up in New York City, its editors are in touch with the best

talent in the country and by selling it widely its cost should be kept well under anything which can be done locally.

This plan provides the subscriber with 8 full page plates ready for the printer each month for $25. These can be made up into an attractive bulletin at a total cost of less than $50 for the first 1,000 copies. This immediately cuts the cost to 1 per cent on a $60,000 budget, or 2 per cent on one of $30,000.

This syndicated service is very flexible as it offers any part of the material at exceptionally low prices. This places it within the range of the smaller health departments and in my judgment represents one of the two most useful projects ever developed by this ASSOCIATION—the other being the attempt to fix somewhat arbitrary, though on the whole, reasonable values for the various health department activities in the so-called *Appraisal Form*.

It has been rightly said that publicity in health work is the most needed and the most neglected of all its activities. This scheme of mass production of syndicated matter is, I believe, the way out for most of us who have neither a large printing fund nor provision for publicity experts in our budgets.

Charles V. Craster, Newark, New Jersey—We have all observed the change that has taken place in the press in the handling of health news. An agent is on the job every time you decide upon any publicity. As Dr. Bundesen has stated, the public is hungry for all kinds of health messages and studies. It is in my opinion, foolish for a health department to try and compete with the newspaper, for the possibilities of getting health education over of the type gotten up by the official agencies is slim indeed, whereas the health stories running in the newspapers to-day are the kind that appeal to the people. I do not say that the health columns, as edited by individuals who have little knowledge of public health, are always right, but I am afraid that we are now in the twilight of popularity as to bulletins issued by health departments. It is my opinion that the press will more and more be taking care of the publicity on public health. Such being the case, I am not sure that health departments should expend much energy upon issuing a health bulletin. For the smaller municipalities, I think the syndicated bulletin being offered by the AMERICAN PUBLIC HEALTH ASSOCIATION is valuable because it gives us actual, solid material, accredited, scientific and authoritative. It will also enable health departments to issue something along the lines of an appeal suitable for the type of person they wish to impress as well as the topic suggested by a previous speaker who stated that something should be prepared for physicians. I feel that we cannot and should not try to compete with the press, and although I look upon Dr. Bundesen's bulletin as a very fine type of journalism, it is one that impresses me as duplicating in part a campaign which has been taken over so enthusiastically and efficiently by the press of the country.

Iago Goldston, M.D., New York City—Seemingly, the jazz spirit ranks next to smallpox in its infectiousness. It is to-day even more epidemic than smallpox. We encounter it in all phases of health education, and I, for one, hope to see, before long, a strong counter agitation which will "debunk" health education and health publicity.

I am not at all sure that in the public health field we ought to imitate the tabloid newspaper with its sensationalisms, its superficialities, and its cheap, emotional appeals. I am not sponsoring the old conservative health department bulletin. But my spiritual and intellectual stomach revolts at some of the up to the "next minute" bulletins. There is a happy medium possible of achievement, and Commissioner Nicoll's weekly bulletin comes pretty close to that happy medium.

From the little experience I have had in editing the bulletins of the New York City Department of Health, I am convinced that we need two types of bulletins—one to go directly to the physician, bringing to him the facts which concern him and deal with *his* problems; the other, a bulletin which will go to lay people—not to the man and woman "in the street," but to the people who deal with health matters in social organizations, settlements, schools, etc.

By illustration: We recently made a study of measles deaths in New York City. We found that in 90 per cent of the cases the mortality from measles was not due to measles as such, but to the complications which followed. We know from practical experiences in our own hospitals that careful nursing and prophylactic measures reduce measles deaths to a negligible minimum. We saw, therefore, that if we could warn parents to be "on guard" during measles epidemics, to husband the strength of their affected children, to secure

medical aid early, etc., we could substantially reduce measles mortalities. But such a message printed in our bulletins would reach only physicians who are powerless to effect these desired ends. For such messages we need a lay as well as a medical bulletin.

It is not so important to introduce the jazz spirit as to make the bulletins useful, addressing them to two types of people—the technical and the lay person—and getting our message across from those two groups.

Burt R. Richards, Albany, New York—There are two factors of vital importance to the success of a health bulletin; the first is the character or make up of the mailing list and the second, dependent on the first, is the character of the contents of the bulletin. Unless the mailing list is carefully selected and consists of the names and addresses of persons who have a direct interest in some phase of health work, the bulletin is liable to receive but scant attention; but even if the mailing list is wisely selected, a health bulletin will still be a failure unless the contents are of a character which will be interesting, stimulating or helpful to the health worker or to the public.

There is probably more money thrown away on ineffective health bulletins than on any other phase of health work simply because sufficient thought is not given to the factors mentioned. A bulletin which is nothing but a filled-in classification of deaths is of no particular interest to anyone but a vital statistician. Better by far is it to take the money spent on such a bulletin and spend it for weekly space in the local paper which can be devoted to telling the community what the health department is doing for the benefit of the people.

A city health bulletin may well be popular or semi-popular in character as it is often possible to send it to lay groups and individuals, but state bulletins must of necessity be devoted to the interests of those whose duty it is to give the health message to the people.

Dr. Bundesen—The way to stimulate a man is to irritate him. I do not know that we said anything about naked girls, but if you have to use the picture of a naked girl to stimulate health interest, then I am for it.

As to the intelligence of the people of Chicago as compared to those of New York, I think we would find upon investigation that it is just about the same, whether it is placed at 12 years, or older.

In the bulletin list of 25,000 we have picked out a group of doctors, members of the Association of Commerce, school teachers and school principals and others. Copies are also sent each Monday to the *Chicago Tribune*, the *Chicago Daily News*, the *Chicago Herald-Examiner*, the *Chicago Evening Post*, and the *Chicago American*. Every week, without exception, these papers take the abstract of the bulletin and give it to the three million people in the city of Chicago, so that we are actually reaching, each week in the city of Chicago, three millions of people. Evidently the newspapers want the kind of stuff we are offering.

BURDETTE AND CAPPS COLLECTION FOR KNOXVILLE HEALTH CENTER LIBRARY

THE GIFTS of two private libraries to the medical reference library being established at the Knoxville, Tennessee, Health Center have been announced by Dr. Marvin F. Haygood, city health officer and manager of the Knoxville Health Center. The medical library of the late Dr. C. H. Burdette of Knoxville, one of the finest private collections in the state, has been donated by his widow. Dr. C. M. Capps of Aspinwall, Pennsylvania, a former resident of Knoxville and now connected with the U. S. Veterans' Bureau, has donated his medical library to the Health Center.

This medical reference library for the physicians of Knoxville and vicinity was one of the recommendations made by Dr. C. St. Clair Drake, associate field director of the Committee on Administrative Practice of the A.P.H.A. when he was in Knoxville conferring with Dr. Haygood.

COMMUNITY CONTROL OF THE ACUTE INFECTIONS*

ARTHUR W. BINGHAM, M.D.
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AND
JOSEPH J. GALLAGHER
Lay Director, Bureau of Hospitals, New York City

CONTROL of the communicable diseases is a community health problem because however much laboratory or hospital or health department may contribute, community diseases are the result of community habits and customs, and these will be changed by the community only on convincing evidence that their cost in deaths and illness is too high.

The most expensive habit is that which considers a minor infection such as a common cold a trivial affair to be ignored or endured but not to be taken seriously as the great opportunity of preventing widespread illness. The beginning of many of the most deadly infections are entangled with the common cold; either because of the difficulty in making the distinction early enough as in diphtheria, or because the cold is the opportunity of many associated respiratory infections to get started as in pneumonia, or because it is the means of spreading in the community virulent infections of carriers as in scarlet fever and others of the respiratory group.

An expensive habit of physicians is to attempt to treat serious infections under unfavorable conditions in homes instead of at once sending patients to special hospitals. Their best efforts are often nullified by lack of the supervision and nursing care which are only possible in the hospital. Surgeons insist on adequate conditions for operations; obstetricians do the same; and physicians will do so, when they recognize the right of the patient from the beginning to the best obtainable nursing care in addition to such medical treatment as they themselves may be able to give.

ATTITUDE OF PUBLIC AND MEDICAL PROFESSION

The least contentious fact in medicine is death. A study of the events which led to the deaths at the Willard Parker Hospital proves that the attitude of both the public and the medical profession toward infections is too often an underlying cause of death.

Fever always means an infection and in the case of children it is the duty of a parent to have the character of that infection determined at the beginning by a competent physician. It is equally the duty of the competent physician not only to determine the infection but also with foresight and judgment to plan the treatment and care of the patient to the end, whether that end is recovery or death.

Two-thirds of the deaths at the Willard Parker Hospital are of patients treated under unfavorable conditions outside until they are so desperately ill that, when sent to the hospital, they are already dying. These moribund cases average only 15 hours in the hospital before they die. It will not be possible to stop these preventable deaths until both the public and the medical profession are

* This is a résumé of the control work in scarlet fever, diphtheria and measles at the Willard Parker Hospital, New York City, 1925–1926.

convinced that the great opportunity to control infections and prevent long illnesses and deaths is at the beginning, and that *any* infection may be a serious one.

It will not be possible to control the spread of such infections as colds and influenza until the community regulates its infinite contacts with judgment and discretion; nor to prevent devastating destruction in individuals by many associated infections such as pneumonia until he who delights in taking a chance conforms to the principles of intelligent management of infections, if not for himself, at least for his children.

STANDARDS OF MEDICAL CARE

The standards of medical care at the Willard Parker Hospital are those established by the performance of the previous year. Every patient with a contagious disease has the right to at least this standard of supervision and medical and nursing care.

In the hospital, comparison of results from month to month and from year to year give direction.

Difficulties in the hospital may be overcome as they are analyzed and understood; difficulties outside the hospital which result in the great number of moribund cases sent in during each year can only be overcome by the response of the public and the medical profession to the information contained in such analysis of results.

The tables of statistics of all cases of scarlet fever, diphtheria and measles treated at the Willard Parker Hospital during the years 1919 to 1926 inclusive are now available for study at the hospital.

The form of these compilations was revised by Dr. Haven Emerson in 1923. The figures for 1919–1923 were published in the AMERICAN JOURNAL OF PUBLIC HEALTH in February, 1925, and for 1924 in the July, 1925, issue.

TABLE I

SCARLET FEVER, DIPHTHERIA AND MEASLES IN NEW YORK CITY IN 1925 AND 1926

	City Including Health Department Hospitals			Health Department Hospitals			City Excluding Health Department Hospitals		
1925	Cases	Deaths	Mort. %	Cases	Deaths	Mort. %	Cases	Deaths	Mort. %
Scarlet fever	8,840	75	.85	1,461	32	2.1	7,379	43	0.58
Diphtheria	9,051	663	7.3	2,154	349	16.2	6,897	314	4.5
Measles	9,483	130	1.3	843	49	5.8	8,640	81	0.93
1926									
Scarlet fever	7,968	77	.9	1,432	27	1.8	6,536	50	0.7
Diphtheria	7,531	477	6.3	2,015	243	12.0	5,516	234	4.2
Measles	39,750	704	1.7	2,118	245	11.5	37,632	459	1.2

	Willard Parker Hospital			Per cent of Borough Cases Admitted to W.P.H.	Per cent of Borough Deaths Occurring at W.P.H.
1925 and 1926	Cases	Deaths	Mort.		
Scarlet fever	1,156	29	2.5	24.4	56.8
Diphtheria	2,415	295	12.2	37.9	69.5
Measles	1,758	156	8.8	9.4	38.6

DEATHS AT WILLARD PARKER WITHIN AND OVER 48 HOURS AFTER ADMISSION

1925 and 1926	Within 48 Hours	Over 48 Hours	Total	Per cent of 48 Hour Deaths to Total Number
Scarlet fever	12	17	29	41.3
Diphtheria	158a	137	295	53.9
Measles	34	122	156	21.7

TABLE II

	Days Ill Before M.D. Saw Case						Days Ill After M.D. Saw Case Before A.T. Was Administered						First Diagnosis			
Age	0	1	2	3	4	5 & later	0	1	2	3	4	5 & later	Right	Wrong	Doubt	Total
1st year	7	9	3				8	4	4		2	1	13	5	1	19
2d year	15	13	3	5	3		20	4	10	2	1	2	29	5	5	39
3d year	2	7	4	1		2	8	2	2	3	1		12	4		16
4th year	3	4	4	2		1	10	4					14			14
5th year	3	6	3	1		2	8	1		2	1	3	10	4	1	15
School children	10	14	4	2	1	1	18	7	3	1	2	1	22	4	6	32
Adults	1	4	1			1	3		2		1	1	3	1	3	7
Total	41	57	22	11	4	7	75	22	21	8	8	8	103	23	16	142

TABLE III

	No. of Cases	Days of Delay Before A.T. Adm.	Days of Delay Due to Parent	Days of Delay Due to M.D.	Hours in Hospital	Total Days Ill
January	5	6.8	4.6	1.8	13	7.2
February	5	6.8	.8	6.0	17	9.6
March	10	3.1	1.2	1.9	10	4.9
Average	20	5.0	2.0	3.0	15	6.0

TABLE IV

DEATHS IN LARYNGEAL DIPHTHERIA TREATED BY INTUBATION DURING THE LAST 5 YEARS AND IN FIRST 3 MONTHS OF 1927

Year	Cases of Diphtheria	Intubations	Per cent	Deaths of Intubated Cases	Mortality %
1922	1650	234	15.1	126	54.0
1923	1122	132	11.7	54	40.9
1924	1132	165	14.5	59	35.8
1925	1273	150	11.8	51	34.0
1926	1142	112	9.8	28	25.0
1927 (3 mos.)	407	22	5.4	2	9.0

Analysis of 142 of the 158 forty-eight hour deaths from diphtheria in 1925 and 1926 shows in Table II the cost of delay in administering antitoxin and giving standard supervision and care.

In 101 cases the parent delayed in sending for a doctor, in 67 cases the doctor delayed in administering antitoxin. Together there was an average delay of 2.5 days in the patients' receiving the right treatment.

INTERPRETATION OF RIGHT TREATMENT

By right treatment is meant the administration of antitoxin immediately upon a clinical diagnosis in the first 24 hours of the illness. As proof of this in 1926, 102 cases of diphtheria were admitted and received antitoxin in the first 24 hours of their illness with only one death.

In the first 3 months of 1925, as shown in Table III, there have been 33 deaths in 407 diphtheria terminations, or 8.1 per cent—20 of these averaged only 15 hours in the hospital.

In 7 of the 20 cases the first diagnosis was wrong and in 5 it was doubtful. The wrong diagnoses were cold 2, grippe 2, tonsillitis 3.

The same relationship exists in other acute infections between delay in giving adequate treatment outside the hospital and the deaths which occur inside the hospital.

This is another argument that both the public and the medical profession will have to change this custom of delay to one of a forward looking offensive from the beginning of illness, if these infections are to be routed and these children saved.

The reduction in the number requiring intubations in 1926 was due to the more effective use of direct inspection of the larynx and suction. During the first 3 months of 1927, this procedure has been further modified.

There are no more chronic tube cases. Any patient after recovery from diphtheria who promises to become a chronic

TABLE V

"CROUPS" FIRST THREE MONTHS OF 1927

	Cases	Direct Inspection	Suction	Cultures	Intubations C	Intubations D	Intubations Per cent	Not Intubated C	Not Intubated D	Not Intubated Per cent
Laryngeal diphtheria	105	97	78	89 KL	22	2	9	83	8	9.6
Common cold laryngitis	45	39	23	2 Staph. / 2 Staph. & Strep.	4	1	25	41	9	21.9

TABLE VI

ANALYSIS OF 1,142 DIPHTHERIA TERMINATIONS IN 1926 ACCORDING TO DAY OF ILLNESS ANTITOXIN WAS ADMINISTERED, COMPARED WITH CASES COLLECTED BY BIGGS AND GUERARD IN 1896

	Willard Parker Hospital, 1926 Cases	Deaths	Mort. %	Biggs and Guerard, 1896 Cases	Deaths	Mort. %
1st day	160	5	3.1	1415	50	3.5
2d day	230	13	5.6	2640	213	8.0
3d day	236	24	10.1	2340	300	12.8
4th day	154	20	11.4	1458	346	23.6
5th day and later	259	43	16.6	1912	671	35.0

tube case is tracheotomized to assure his safety while the larynx is restored to normal.

The lowest mortality is obtained by giving antitoxin and beginning treatment by rest, warmth, food and nursing in the first 24 hours. This axiom is proved in diphtheria—it is true in all the acute infections.

ANALYSIS ACCORDING TO SOURCE OF CASES

	Cases	Deaths	Mort. %
Homes	830	92	11.0
Hospitals	212	11	5.1
Other Institutions	100	4	4.0

It is the general practitioner whose understanding and coöperation is needed to reduce these mortalities from the acute communicable diseases.

ANALYSIS ACCORDING TO MEMBRANES VISIBLE ON CLINICAL EXAMINATION AND BY CULTURES REPORTED FROM LABORATORIES

	Cases	Deaths	Mortality
No membrane—Positive culture	183	3[1]	1.6
Membrane—Positive culture	553	85	15.3
Membrane—Negative culture	406	19	4.9

1. One of these deaths was due to marasmus, 2 to broncho-pneumonia.

These 19 deaths were due to: myocarditis 6, post-diphtheritic paralysis 5, lung abscess in chronic tube case 1, toxemia 4, and broncho-pneumonia 3. They were undoubtedly diphtheria deaths resulting from delay in the administration of antitoxin. All of the 406 cases were treated with antitoxin on a clinical diagnosis, and if it had not been given, there would certainly have been many more deaths in this group.

In 1925 and 1926 there were 1,156 cases of scarlet fever treated, with 29 deaths or 2.5 per cent. Of these 29 deaths, 13 occurred within 48 hours after admission to the hospital.

In the first 3 months of 1927 there have been 325 scarlet fever terminations with 8 deaths, 6 of these within 48 hours after admission.

ANALYSIS OF THESE 6 CASES ACCORDING TO DELAY IN HOSPITALIZATION

	Days of Delay Before Admission	Days of Delay Due to Parents	Days of Delay Due to M.D.	Hours in Hospital	Total Days of Illness
Average of 6 cases	17	2	15	17	18

In 1926, 384 cases of scarlet fever were treated of whom 14 died; 172 were given scarlet fever antitoxin of whom 9 died.

ANALYSIS OF THESE 172 CASES ACCORDING TO DAY OF ILLNESS ANTITOXIN WAS GIVEN

	Cases	Deaths	Per cent
1st day	7	0	0.0
2d day	42	1	2.3
3d day	63	2	3.1
4th day	34	1	2.9
5th day and later	26	5	19.2

COMPLICATIONS IN 1,156 CASES IN 1925 AND 1926

	Before Admission		After Admission	
	C.	D.	C.	D.
Otitis	64	..	57	..
Mastoiditis	25	1	14	1
Nephritis	8	1	3	1
Broncho pneumonia.	12	7	9	4

Of complications developing after admission in 1926, 6 developed broncho-pneumonia, 3 between the sixth and twenty-fifth day of illness and 3 after the twenty-fifth day. Three died. Nine developed mastoiditis, 4 between the tenth and twentieth day and 5 after the twenty-fifth day of illness, and one of these died.

MARKED DECREASE IN SCARLET FEVER

The small number of deaths and of serious complications in the scarlet fever cases in 1925 and 1926 are in marked contrast to those in 1922 and before. The use of scarlet fever antitoxin has lessened the number of toxic and septic cases and the number of severe complications following the severe infections.

SOURCE OF SCARLET FEVER PATIENTS IN 1926

	Cases	Deaths	Mortality
Home	288	11	3.6
Hospitals	58	3	4.9
Institutions	24	0	0.0

In scarlet fever, even with the small number of deaths, there is the same need of early hospitalization and specific treatment as in diphtheria.

MEASLES AND COMPLICATIONS

For measles 1925 was a non-epidemic and 1926 an epidemic year. In the years 1925 and 1926 combined there were 1,758 cases treated with 156 deaths, a mortality of 8.8 per cent. Of the 156 deaths, 139 or 89.1 per cent, were in the first 3 years of life and 142, or 91 per cent, were from broncho-pneumonia. In 314 cases of broncho-pneumonia present

TABLE VII

ANALYSIS OF 55 CASES OF BRONCHO-PNEUMONIA DEVELOPING IN 904 CASES OF MEASLES AFTER ADMISSION TO THE HOSPITAL ACCORDING TO DAY OF ILLNESS ADMITTED

Day of Rash or Fever Adm.	Cases of Measles	Cases of Broncho-pneumonia	Percentage	Deaths	Mortality of Broncho-pneumonia
1st	87	3	3.4	0	0
2d	201	12	5.9	6	50
3d	263	17	6.4	3	17.6
4th	154	8	5.1	4	50
5th	94	8	8.5	2	25
6th and later	105	7	6.7	2	28
Total	904	55	6.	17	30.9

TABLE VIII

DEATHS AT WILLARD PARKER HOSPITAL 1919–1926

Disease	1919	1920	1921	1922	Av. Mort. Per Cent	1923	1924	1925	1926	Av. Mort. Per Cent
Scarlet Fever	31	75	114	75	8.8	28	11	15	14	2.9
Diphtheria	425	308	260	299	16.8	135	151	188	107	12.4
Measles	58	148	34	269	16.7	74	102	41	115	9.8
Totals	514	531	408	643		237	264	244	236	

Total deaths 2,096, average mortality 15.6%. Total deaths 981, average mortality 6.2%

FIRST 3 MONTHS OF 1927 CONTRASTED WITH FIRST 3 MONTHS OF 1922

	Cases	Deaths	Mortality Per Cent	Cases	Deaths	Mortality Per Cent
Scarlet Fever	334	8	2.3	499	128	25.7
Diphtheria	407	33	8.1	236	35	14.8
Measles	15	2	13.3	488	114	23.3
Totals	756	43	5.6	1,223	277	22.3

on admission 125, or 39.8 per cent, died. In 55 cases of broncho-pneumonia developing in the hospital 17 or 30.9 per cent, died.

This is evidence that good care of the patient with pneumonia in measles from the beginning of the illness lowers the mortality.

SOURCE OF THE 1,098 CASES TREATED IN 1926

	Cases	Deaths	Percentage
Homes	694	79	11.3
Hospitals	327	30	9.1
Other Institutions	71	6	7.7

In planning to meet the next epidemic of measles, the general practitioner should be alive to the need of protecting all children in their first 3 years from this infection. If, however, such children acquire measles, they should receive the care and nursing available at the Willard Parker Hospital unless even better care is possible in the home from the beginning. That means the 3 days of fever before the rash appears.

Compared with this, of 194 cases of broncho-pneumonia present on admission 87, or 44.8 per cent, died.

The advance in the standards of medical care is shown by a comparison of results in the last 4 years with those in the preceding 4 years and of the first 3 months of 1927 with the first 3 months of 1922.

EXCLUDING CASES ADMITTED TO THE HOSPITAL, THOUGH MORIBUND BECAUSE OF PREVENTABLE DELAY, THE FIRST 3 MONTHS OF 1927 SHOW

	Cases	Deaths	Mortality Per Cent
Scarlet Fever	328	2	0.6
Diphtheria	387	11	2.8
Measles	14	1	7.1
Totals	729	14	1.9

No one of these 14 patients who died was admitted and given antitoxin on the first or second day of illness. During the same period of 3 months, 3 cases of scarlet fever and 38 cases of diphtheria were admitted and given antitoxin on the second day of illness with only 2 deaths, both moribund "croup" cases, one dying within 12 hours and the other within 1 hour after admission.

These possible mortalities of 1.9 per cent for 729 cases not moribund on admission of 1.1 per cent for 176 cases of scarlet fever and diphtheria admitted and given standard treatment from the beginning are to be compared with the actual mortality of 15.6 per cent for the years 1919–1922 and of 6.2 per cent for the years 1923–1926.

This is proof of how great a number of deaths from these diseases are prevent-

able and how and by whom they can be prevented.

These records prove also that the essential of efficiency in the medical care of the acute infections lies in their recognition and beginning treatment, both specific and general in the first 24 hours of the illness, and they show the possibilities if both public and medical profession will coöperate with the health department hospitals in giving patients with scarlet fever, diphtheria and measles from the beginning of illness, such medical and nursing care as is now available at the Willard Parker Hospital.

CONCLUSIONS FROM STATISTICS

Certain conclusions to be drawn from these statistics seem reasonable.

First—The need of protecting children to the greatest possible extent from all infections during the first 3 years. This protection may be given by immunization as early as 6 months as in diphtheria and smallpox, or by prevention of contact with active cases or passive carriers of the primary infections including the common cold as a primary infection.

Second—The need of recognizing and beginning treatment of every infection, beginning in the nose and throat, in the first 24 hours. This may be done by giving appropriate specific antitoxin, if there is one, or by aiding the patient to produce his own by providing rest, warmth, food and nursing.

Third—The first day of illness is the supreme opportunity in the control of the acute infections. The prevention of complications and deaths depends directly upon the day of illness when treatment is begun.

Fourth—Broncho-pneumonia, so frequently secondary to the specific primary infections and the most frequent cause of death in these infections, likewise may be secondary to the common cold regarded as a primary infection. The common cold deserves the same treatment as measles because it so frequently precedes pneumonia, because it spreads any infection of any organism in the nose or throat of carriers, because it so often prevents the diagnosis of diphtheria until too late, and because it, by repeated attacks, so injures throat, sinuses and tonsils as to greatly increase the susceptibility of the individual to all the associated infections of the respiratory tract.

Fifth—Willard Parker Hospital Standards are those determined by the performance of the previous years. They offer a sound basis for further advance in treatment. Comparison of results from month to month give direction for this advance and promote the medical efficiency of the hospital plant in the production of life and health.

SUMMER SCHOOLS FOR SANITARIANS

PUBLIC HEALTH courses will be given at several university summer sessions this year. These courses will be based on practically every phase of health work including introductory courses in public health, public health administration, industrial hygiene, administration of health work in the schools, organization and supervision and teaching methods of health education in elementary and secondary schools and colleges. Principles of public health nursing, hospital administration, nutrition, mental and social hygiene are included in the more extensive public health curricula.

Columbia University is offering one of the most extensive courses. University of Chicago and Massachusetts Institute of Technology have scheduled a course under the title "Public Health Laboratory Methods." Rutgers University will present its public health courses in collaboration with the New Jersey State Department of Health. University of Pennsylvania and Harvard University are offering a variety of lecture and laboratory courses for the sanitarian. Lectures at Stanford University Summer School for Sanitarians will be supplemented by laboratory and field work.

ELIMINATING POLLUTION FROM THE GREAT LAKES AND ST. LAWRENCE WATERWAYS *

Progress in Eliminating Pollution from the Great Lakes and the St. Lawrence Waterways was discussed at a session of the Public Health Engineering Section of the American Public Health Association at its Fifty-fifth Annual Meeting at Buffalo, New York, October 12, 1926.

Dr. McLaughlin opened the discussion. The paper by J. W. Ellms was a contribution to this session. The following papers will be published in succeeding issues of the JOURNAL.

Lake Superior
George H. Ferguson, Sanitary Engineer, Dominion Department of Health, Ottawa, Ont.

Lake Michigan
Langdon Pearse, Sanitary Engineer, Chicago Sanitary District, Chicago, Ill.

Lake Huron, Detroit and St. Claire Rivers
Gardiner Legg, Sanitary Engineer, Detroit Department of Health, Detroit, Mich.

THE GREAT LAKES *

ALLAN J. McLAUGHLIN, M.D., FELLOW A.P.H.A.
Surgeon, U. S. Public Health Service, St. Louis, Missouri

IN THE CLOSING decade of the Nineteenth Century, great American cities were using for water supply the sewage polluted water of great rivers and lakes without filtration. Hamburg, Germany, had its tragic lesson in 1893, using the unfiltered water from the Elbe, when 8,000 deaths from Asiatic cholera occurred in one month. In 1905, I was ordered to Hamburg because of the outbreak of cholera among immigrants, to enforce the United States Quarantine Regulations for ships destined to United States ports. Hamburg's filtration plant had been installed some years after the disaster of 1893, and the outbreak of 1905 was quickly suppressed without spread. The fear of Asiatic cholera was a potent force in encouraging American cities to purify their water supplies. A case of cholera on a ship in New York or Boston caused a condition akin to panic, while the country had accepted with complacency 30,000 deaths from typhoid fever each year. This curious apathy toward waterborne typhoid is difficult to explain. Our people looked upon typhoid as an inevitable visitation which came each year and took its tragic toll of death.

In the fall of 1910, after considerable experience with cholera in the Philippines, I was ordered back to the United States. Some cases of cholera and a number of carriers had been brought to New York from Italy. I was directed to prepare a manual for health officers covering the measures necessary to prevent the introduction and spread of cholera. In conference with Surgeon General Wyman, I

* This covers the writer's connection with the problems of sewage pollution of the Great Lakes Drainage Basin, a period of four years from October, 1910, to October, 1914.

stated that the continued excessive prevalence of typhoid fever in our cities was a national disgrace and a far greater reason for federal activity than Asiatic cholera. He assigned to me the task of investigating the relation between sewage pollution of interstate and international waters and the spread of typhoid fever. Federal authority was limited to investigation and advice, but the collection of the facts and their publication by the federal government would be of great assistance to state and local health officers and to sanitary engineers in their battle with municipal councils for purification of public water supplies.

DRAINAGE OF GREAT LAKES AREA

The sanitary surveys to have value must cover entire drainage basins regardless of state lines, and the first area selected was the drainage basin of the Great Lakes. The facts included the mapping of sewer systems and outfalls and their relation to water works intakes, the type and efficiency of filter plants where these existed, and the typhoid history of the city or town, with special stress on the seasonal prevalence of typhoid. By July, 1911, the facts were obtained and ready for publication for all cities and towns in the drainage basin of the Great Lakes on the American side from Duluth, Minnesota, on Lake Superior, to Ogdensburg, New York, on the St. Lawrence. Briefly, the conditions found were as follows:

An excessive prevalence of typhoid fever especially occurred in the winter and spring months, punctuated at intervals by explosive epidemics. This was due in greatest measure to the unrestricted discharge of sewage into interstate and international waters used as sources of public water supplies. Disaster followed the use of this sewage polluted water for one of two reasons, either a failure to purify or the inefficiency of the attempted purification. The delusion that water from the Great Lakes or their connecting rivers needs no purification has been cherished for years in our cities and even with our disgraceful record of water-borne typhoid and the lessons of numerous disastrous epidemics, it is still no easy task to convince municipal officials that purification of these waters is necessary.

REMEDIES FOR PURIFICATION

The remedies suggested by the writer at that time were:

1. Safe water supplies, that is, water shown to be safe by daily bacteriologic examination

2. Supervision and control of water supplies by the state to ensure efficiency and a safe effluent at all times

3. Control of sewage discharge within permissible limits to prevent an unreasonable burden or responsibility upon filter plants

4. Prevention of pollution from vessels

In order to secure efficient and uniform results from the application of these remedies, Surgeon General Wyman recommended that two sets of standards for water be formulated.

1. Standards for filtered or treated water

2. Standards for raw water at the intakes

Recommendations were also made by the writer to the Surgeon General to employ sanitary engineers and to make more intensive studies of the pollution of interstate waters. In 1913, a group of sanitary engineers, chemists, biologists, and bacteriologists were assembled by the U. S. Public Health Service and an intensive study of stream pollution was begun.

In accordance with this recommendation, in January, 1913, the Surgeon General appointed a Commission for the Determination of a Standard of Purity for Drinking Water, and the report of that Commission furnished a minimum standard to which all common carriers, trains and vessels must conform to prevent the spread of disease in interstate traffic. This

furnished the first standard recommended. The fixing of the second standard or standard for raw water at the water works intakes is a much more complex problem. However, great strides have been made in this direction also.

A committee of the National Association for the Prevention of Pollution of Rivers and Waterways, made up of George C. Whipple, Edward Bartow, George M. Wisner, H. W. Clark, and the writer, studied the problem of standards in a general way and agreed upon certain fundamental principles which made a very good starting point for more intensive studies. This brings us to the work of the International Joint Commission.

The term commission is misleading, as this body is in reality a tribunal formed under the treaty of January 11, 1909, between Great Britain and the United States to prevent disputes regarding the use of the boundary waters and to settle questions now pending or which may arise hereafter between the United States and Canada involving the rights, obligations or interests of either in relation to the other or the inhabitants of the other along their common frontier. In addition to their judicial powers the commission under Article IX of the treaty is empowered to investigate and report upon such questions as may be referred to it by the two governments. It is provided that such reports under Article IX shall not be regarded as decisions of the questions and shall in no way have the character of an arbitral award under this investigative function.

The question of pollution of boundary waters was referred to the commission by the two governments. The reference was in two sections, the first dealing with the location, origin and extent of pollution and the second dealing with remedies.

CAUSES OF POLLUTION

The commission took up first the question of location, origin and extent of pollution. At the Detroit session, February 20, 1913, the writer was placed in charge of the investigation as chief sanitary expert and director of field work. Associated with him on the Canadian side were Dr. John W. S. McCullough, Chief Health Officer of Ontario, Dr. John A. Amyot, Professor of Hygiene, University of Toronto, and Frederick A. Dallyn, Sanitary Engineer, Ontario Provincial Department of Health. Canadian laboratories were established at Fort Frances, Port Arthur, Sault Ste. Marie, Sarnia, Windsor, Amherstburg, Port Stanley, Fort Erie, Niagara-on-the-Lake, Kingston (Ontario), and Montreal. American laboratories were established at Port Huron and Detroit, Michigan; on U. S. Revenue Cutter Morrill; at Buffalo, Youngstown and Clayton, New York; and Van Buren, Maine.

In the interest of economy and efficiency it was deemed wise to utilize such established governmental agencies as might be available for the field investigation.

Accordingly the coöperation of the U. S. Public Health Service, the Provincial Boards of Health of Ontario and Quebec, the State Board of Health of Michigan, and the Department of Health of the State of New York was obtained and was of very great value to the commission in carrying out the work.

PROGRAM OF INVESTIGATION

The work extended from the Lake of the Woods through the entire chain of the Great Lakes and St. Lawrence River to the St. Johns River on the Maine-New Brunswick border. Field work began in April and terminated November 1. There were over 1,400 sampling points and over 19,000 samples taken and examined bacteriologically. The report presents as indices of pollution the average number of the colon bacillus per 100 c.c. of water and the number of bacteria per c.c. of water. The results of the investigation are shown by averages in concise form for each sampling point and

cross-section by tables and colored maps. In addition, diagrammatic representation is employed to show the degree of intensity of the area of pollution in each section of the boundary waters. In certain localities on the Great Lakes and in all their connecting waters dangerous sewage pollution was shown to exist, but the bulk of the Great Lakes waters remains in its pristine purity.

The investigation shows that the colon bacillus is practically never present in unpolluted waters, and that the normal bacterial content of Great Lakes water is less than 10 per c.c. Great Lakes water is classified tentatively into five classes in this report, from the relatively pure water through slight, moderate, serious to gross pollution.

The sources of pollution in the order of their importance are sewage from cities, sewage from vessels navigating these boundary waters, and the inevitable pollution following rains and thaws. The distance pollution may travel in the lakes was demonstrated also. At the mouth of the Detroit River and at the mouth of the Niagara River serious pollution extends normally more than 10 miles into the lakes, and on occasion was found 16 to 18 miles from shore. The distances from the cities of pure water in the lakes, the enormous cost of long pipe lines, coupled with the engineering difficulties in placing intakes beyond a 70 foot depth, make it impracticable in most instances to obtain pure water from the lakes without treatment. The present position of intakes is such that there is not a single municipality using lake water which can be said to possess at all times a safe water supply without treatment.

This report completed the first phase of the investigation, namely, obtaining the facts of the location, origin and extent of pollution. The second phase as to remedies was a purely engineering question and I recommended to the commission the employment of sanitary engineers to complete the work of outlining the remedies which would correct or prevent pollution.

LAKE ERIE AND THE NIAGARA RIVER

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THIS SUBJECT, as it relates to Lake Erie, presents two phases, namely, the pollution of the lake at its inlet and outlet, and the pollution opposite centers of dense population in the cities situated on or near its shores. At its inlet, the contamination of the water is derived from the cities on the American and Canadian sides of the Detroit River. At its outlet, the chief source of pollution is the sewage from the cities on the American side of the Niagara River.

Along the shore there are several large cities and many smaller ones, chiefly on the American side, which discharge their sewage directly into the lake. Toledo, although not directly on the lake, sends its sewage through the Maumee River into the lake. Cleveland is the largest city located on the shore of the lake, and discharges 75 per cent or 80 per cent of its sewage directly into the lake from two main outfalls, and the remainder through the Cuyahoga River. Through this river is also discharged the sewage of the city of Akron, Ohio, as well as from a number of small communities located between the latter city and Cleveland. Many smaller towns either on the lake shore, or on or near small streams which empty

into the lake, dispose of their sewage directly in the lake or into the streams on which they are located.

The land drainage area of the lake covers approximately 25,000 square miles, of which nearly 75 per cent is in the United States and 25 per cent in Canada. Probably the sewage of more than four million people finds its way either directly or indirectly into the lake. The greatest pollution is found in the Detroit and Niagara Rivers, and is, of course, derived from the urban population on both sides of the international boundary. Through these two rivers the direction and rate of flow is practically uniform, and, in consequence, sewage contaminated water distributes itself in accordance with the laws of stream flow. The influence of the islands in these rivers, and the higher velocity of flow in the Niagara River, necessarily affect, through variations in lateral and vertical stratification, the distribution of this pollution.

POINTS OF MAXIMUM POLLUTION

The western end of the lake, east of the chain of islands in this section, is naturally more or less contaminated by the large volume of polluted water discharging through the Detroit River. In spite of the great dilution and natural agencies of purification afforded, the sewage of over a million and a half of people must leave its mark upon the water in this section of the lake. Detroit and its suburbs, through 50 or more sewer outlets, discharge an estimated volume of 225,000,000 gallons of sewage and trade wastes daily into the river or its tributaries. Probably 10 to 15 million gallons more of sewage from the other cities on its banks find their way into the river beside that from the Detroit sewers.

The contamination of the Niagara River is derived chiefly from the sewage of the city of Buffalo with a population of over half a million people. The volume of sewage is probably in the neighborhood of 100 m.g.d. The city of Niagara Falls and the remaining towns along the river contribute also their quota to the contamination of the water, so that the river on emptying into Lake Ontario pollutes the latter for a considerable distance from the shore.

The pollution of Lake Erie in the vicinity of the towns and cities on the shores presents another phase of this problem that directly concerns these communities themselves, and cannot be passed on, as in a flowing stream, to their neighbors below them. In spite of the theoretical possibility of great dilution of this sewage in the lake water, diffusion is slow, and is greatly affected by water currents, both lateral and vertical, induced by changing meteorological conditions. While zones of pollution in general diminish in intensity in proportion to the distance from the point of discharge of the sewage, nevertheless areas of great pollution may be found at times quite distant from the source, due to the direct carriage of sewage by surface and sub-surface currents. Herein lies the potential danger of the contamination of public water supplies at their intakes located in the lake.

HOW CITIES ARE HANDLING POLLUTION ELIMINATION

As to general progress toward the actual elimination of sewage pollution from Lake Erie by the cities on its shores, little can be said. Detroit has a plan for a comprehensive sewer system, coupled with primary treatment in settling tanks, disinfection of the effluent and its final discharge through submerged outfalls in the Detroit River. The estimated cost of this project is approximately $40,000,000; but nothing has been done toward construction so far as the writer can learn.

Toledo is struggling with the problem of a more adequate and better water supply taken from the lake, but which is necessarily complicated by the ultimate discharge of all of its sewage into the lake through an intercepting sewer system, now in process of construction. A report

has been made to the city recommending the completion of the intercepting sewer system and eventually treatment of the sewage before its discharge into the lake.

Cleveland is also completing its intercepting sewer system in connection with an Imhoff tank and sprinkling filter plant now being constructed to care for about 20 per cent of its sewage. The present interceptors discharge through two outfalls directly into the lake. At the end of one interceptor screens, grit chambers and Imhoff tanks remove a portion of the suspended solids from the sewage, but turn an effluent into the lake averaging about 25 m.g.d. that is far from what it should be. Another interceptor discharges on an average about 90 m.g.d. directly into the lake. This sewage is screened through bar gratings and the grit removed. It is for all practical purposes not much more than raw sewage. These two outfalls discharge about 115 m.g.d. of sewage through submerged outfalls at a distance of about 2,500 feet from the shore. Disinfection of the sewage from these two outfalls is provided for during the bathing season or for about three months of the year. Buffalo discharges its raw sewage directly into the Niagara River and its tributary, the Buffalo River. It has no sewage treatment plant, and none is contemplated so far as the writer can ascertain.

Of the many smaller cities, there is but one, located at Sandusky, Ohio, that has a sewage disposal plant including primary and secondary treatment, and this plant has never been operated since it was built. One or two small cities have plants for partial treatment of their sewage, and some employ disinfection. Their influence upon general conditions of lake contamination, however, is negligible. In fact, most of the towns and cities, both in the United States and Canada, have attempted to protect themselves by filtering and disinfecting their water supplies, or disinfecting them only. Some have constructed or extended their intercepting sewer systems in order to localize their sewage discharges, and thereby avoid contamination of their water supplies when drawn from the lake. In some of the larger cities the intakes in the lakes have been moved farther out several times in order to escape pollution of their own water supplies.

CAUSE OF DEPRECIATION OF LAKE FRONT PROPERTY

There is an angle to this problem that is coming to the attention of the larger communities particularly, which merits mention. The depreciation of property values along the lake fronts, from the filth which the communities discharge through their sewers, is awakening the public to the needs for more adequate methods of sewage treatment. Bathing beaches are unsafe for bathers, boating is unpleasant because of floating sewage solids, and summer residence along the shore has serious drawbacks because of the foul condition of the shore waters. Oil and other trade wastes are a menace to shipping and to public water supplies. These conditions obtain not only in the inlet and outlet rivers of the lake, but in the immediate vicinity of the larger cities, and to a lesser degree only in the smaller communities, simply because of the less dense population on the shores of the lake.

That more active efforts should be made to preserve these great inland lakes of fresh water for water supply and recreational purposes seems obvious, and the difficulties involved merit the attention and study of all who may speak with authority on this great sanitary problem.

THE RELATION OF THE TUNNICLIFF AND FERRY DIPLOCOCCI TO MEASLES *

WILLIAM H. PARK, M.D., Fellow A.P.H.A.; ANNA W. WILLIAMS, M.D., Fellow A.P.H.A., and MINNIE WILSON

City Laboratories, Department of Health, New York City

THIS PAPER is entirely concerned with the study of the diplococcus which has been suggested to be the cause of measles by Dr. Tunnicliff and of the green producing streptococci claimed to be the cause of measles by Dr. Ferry.

As is well known Tunnicliff [1] in 1917 described a micrococcus which she obtained from the blood of early cases of measles. She did not obtain this regularly from the cases at first, giving as her reason that they grew with difficulty, but later she almost never failed to obtain them. There were certain cultural differences in the strains. For instance, one strain was definitely an anaerobe and some did and some did not produce acidity in milk. She believes that with this culture she successfully produced measles in rabbits and noted that these rabbits after their recovery became resistant to later inoculations. These effects were produced not only with the primary cultures but with those of the fifth transfer. She observed that strains of other types of streptococci obtained from the blood either early or late in the disease did not produce measles. This seemed to her to make unlikely the claim that it was not the diplococci but rather a filterable virus which had grown in symbiosis with the supposedly specific green diplococci, which produced the disease. She found that while a filtrate alone or the dead diplococci alone failed to give any distinctive diagnostic cutaneous reaction, that the whole culture fluid containing both culture and toxic fluid did give differential results between immune and non-immune children and animals. The serum of immunized animals also neutralized the toxic culture fluid. She stated that the mixed culture fluid and organisms regularly produced a reaction in the skin of children who had not had measles, but not in convalescent measles patients or in 96 per cent of those who gave a history of having had measles. She further stated that the serum of goats injected with the cultures, when injected into children within two days of exposure to measles, prevented the disease in the majority and modified it in the others a little later.

Ferry [2] obtained from an early case of measles a green streptococcus from the blood which made a strong toxin. In his hands 0.1 c.c. of a 1 to 400 dilution of the filtered toxin produced a skin reaction in the great majority of susceptible children and very rarely in those who had had measles. He produced in animals an antitoxin for the toxin. He considered his culture as distinct from the ones isolated by Tunnicliff, because of her statement that hers was a diplococcus and that it did not make a soluble toxin. In our hands both cultures make a toxin, but that from Ferry's culture is much stronger. They seem to us to be similar organisms.

The published reports of Tunnicliff and of Ferry certainly seem to present very impressive evidence of the etiological significance of a diplococcus growing in

* Read before Laboratory Section of the American Public Health Association at the Fifty-fifth Annual Meeting at Buffalo, N. Y., October 13, 1926.

TABLE I

SHOWING PERCENTAGE OF CASES FROM WHICH GREEN STREPTOCOCCI (NON-HEMOLYTIC) WERE ISOLATED AT VARIOUS STAGES OF MEASLES

			Green Streptococci		
			Positive	Doubtful	Negative
Stage of Disease	No. of Cases	Percentage of Cases from which Green Colonies Were Isolated	Green and Ascitic Colonies Like Tun. No. of Cases	Green Col. Like Tun. Ascitic Col. Not Like Tun. No. of Cases	Col. Not Green Morphology of Col. Like Tun. Ascitic Col. Not Like Tun. No. of Cases
Pre-eruptive	20	70	13	2	5
First day rash	19	89	16	1	2
Second day rash	11	72	7	1	3
Old rash	7	71	5	0	2
Controls:					
So-called influenza	9			9	

The cultures in our "Positive" column correspond to the description given by Tunnicliff of the colonies isolated from rubeola. The following is her description: on blood agar the colonies are small punctate, green. On ascitic agar, the colonies are small, round, homogeneous, smooth-edged.

short chains. There were, however, several difficulties which prevented us from being completely convinced. It seemed difficult to understand how a diplococcus which appeared in enormous numbers in the discharges from the eyes, nose and throat during the catarrhal stage of measles should be absent in cases, as shown by its lack of contagiousness, from the upper respiratory tract during the period of incubation. If measles were due to this diplococcus it would seem probable that like diphtheria and scarlet fever that soon after the transfer of the infecting microbe, it would begin to develop and produce symptoms and spread infection.

Again in almost all diseases due to bacterial infection there are a greater or lesser number of cases in which the infecting microbes persist. Cultures as well as transmitted infection to others reveal this. Measles like smallpox, mumps, chickenpox, yellow fever and most other diseases supposed to be due to filterable viruses has a long period of incubation when it is not communicable and then, when convalescence is established, it suddenly ceases to spread contagion.

While impressed by the evidence submitted by Tunnicliff and Ferry we were still doubtful and we felt it wise to undertake seriously an attempt to corroborate their findings. In order to make these studies possible we applied for and obtained a grant of money from the Milbank Memorial Fund. To our force we added a number of technical assistants.

Our first endeavor was to discover through cultures whether the diplococci were regularly present in the pre-eruptive and eruptive stages and whether the strains were the same in the different cases. It is only fair to state that the cultures tested by us were from the mucous membranes and not from the blood, but many of them were identical with either the Tunnicliff strain or the Ferry strain. The results of our work are shown in the tables presented here.

Table I gives the results so far as the appearance of colonies on blood and ascitic agar indicate identity.

The results viewed from the etiological standpoint are perplexing. Eighty-four per cent of the cultures from the measles cases gave characteristic colonies on both blood and ascitic agar, while in cultures from 9 control cases characteristic colonies were not found. They were absent, however, in the cultures from 16 per cent of the measles cases and their persistence during the period of the fading rash was somewhat disquieting since the cases had reached a stage when some were supposed to be but slightly and others not at all communicable.

Twenty-two of these strains (see Table II), together with the Tunnicliff and Ferry strains sent us by these investigators were studied as to their action on carbohydrates. Six different groups were

TABLE II

22 STRAINS TYPED BY CARBOHYDRATES AS COMPARED WITH TUNNICLIFF'S AND FERRY'S

Type	Maltose	Salicin	Inulin	Mannite	Raffinose	No. of Our Strains in This Type	Stage of Disease
Tunnicliff.....	+	+	+	—	+	6	2 pre-eruptive 3 1st day rash 1 8th day convalescence
Our 2. E.....	+	—	+	—	—	2	1 pre-eruptive. This is tonsil type of culture case 1 3rd day of rash
5. T.....	+	—	+	—	+	2	4th day of convalescence
4. T.....	+	+	+	—	—	0	
67. T.....	+	+	—	—	+	7	1 pre-eruptive 1 1st day of rash 5 2nd day of rash
Ferry.....	+	—	—	—	+	1	11th day of convalescence

The strains shown in Table II are similar to Tunnicliff's on blood-agar, acsitic-agar and in bile test.

found, only two of which contained many cultures, namely, the Tunnicliff and our 67 T. It is striking that the Ferry and Tunnicliff strains are different as to their action on salicin and inulin. These findings are somewhat disconcerting and rather suggested the possibility that these diplococci are complicating microörganisms. We then tested different strains for their reaction to the agglutinin developed by the Tunnicliff strain, the Ferry strain and our 67 T strain. (See Table III.)

It is noted that the rabbit blood serum which had been removed from the rabbit treated by injections of the Tunnicliff strain agglutinated strongly only one of the strains other than the Tunnicliff and only one other in very low dilution. The serum from the Ferry rabbit serum agglutinated 2 of the 12 strains, and the serum from our 67 T none of the 7 strains tested. We then tested the strains by agglutinin absorption and found the same results as by direct agglutination. (See Table IV.)

These results are not incompatible with the possibility that while these strains differ so markedly in their reaction to specific agglutinins that they may produce the same toxin. We know that there are many different agglutinative types of diphtheria bacilli, scarlet fever streptococci and pneumococci, but the great diversity of these strains suggests that they like the influenza bacilli which have the same great diversity may be only complicating slightly pathogenic bacteria.

When the work was begun we planned to make cultures from a few of the cases from time to time from the beginning of the disease until after convalescence, but

TABLE III

COMPARISON BY DIRECT AGGLUTINATION OF OUR GREEN STREPTOCOCCI WITH TUNNICLIFF'S AND FERRY'S Cultures Isolated from Various Stages of Measles

		AGGLUTINATING SERUMS						
		Tunnicliff		Ferry 01860		Our 67–F	
Stage of Disease	Bacterial Suspensions Strain Number	Rabbit Serum No.	Titre with Homologous Antigen	Titre with Other Strains	Titre with Homologous Antigen	Titre with Other Strains	Titre with Homologous Antigen	Titre with Other Strains
	Tunnicliff.....	20	3200		1600	—	3200	3200
	Ferry 1.....		3200	—	1600		3200	—
	Ferry 2.....		3200	—	1600	1600	3200	—
Pre-eruptive	67–T.....	31	3200	3200	1600	—	3200	
	2–E.....	20	3200	—	1600	—		
	T.....		3200	—	1600	—		
	4–T.....	C	800	—	1600	1600		
	9–E.....		800	—	1600	—		
	27–E.....	20	3200	100	1600	—	3200	—
	33–T.....		3200	—	1600	—	3200	—
	91–E.....	20	3200	—	1600	—	3200	—
First Day Rash	1–E.....	20	3200	—	1600	—	3200	—
	N.....		3200	—	1600	—	3200	—
	18–E.....	C	800	—	1600	1600		

— Means no agglutination in 1:100 dilution.

Explanation of Strain Number: The numeral refers to serial number of the case, the letter to source of the culture: E (eye), N (nose), T (tonsil).

TABLE IV

OUR GREEN STREPTOCOCCI FROM MEASLES COMPARED WITH TUNNICLIFF'S AND FERRY'S BY AGGLUTININ ABSORPTION

		AGGLUTININ SERUMS				
		Tunnicliff			Ferry 01860	
Stage of Disease	Absorbing Cells Strain No.	Rabbit Serum No.	Titre with Homologous Antigen Before Absorption with Cells Listed Under "Strain Number"	Titre with Homologous Antigen After Absorption	Titre with Homologous Antigen Before Absorption	Titre with Homologous Antigen After Absorption
	Tunnicliff..	20	3200	—	1600	1600
	Ferry 1....		3200	3200	1600	—
	Ferry 2....		3200	3200	1600	—
Pre-eruptive	67–T.....	20	3200	—	1600	800
	2–E.....		3200	3200	1600	1600
	T.....		3200	3200	1600	400
	4–T.....	C	800	800	1600	1600
	9–E.....		800	800	1600	800
	27–E.....	20	3200	1600	1600	800
	33–T.....		3200	3200	1600	400
	91–E.....		3200	3200	1600	800
First Day Rash	1–E.....		3200	3200	1600	1600
	N.....		3200	3200	1600	1600
	18–E.....	C	800	800	1600	200

— Means no agglutination in 1:100 dilution.
Explanation of Strain Number: The numeral refers to serial number of the case, the letter to source of the culture: E (eye), N (nose), T (tonsil).

in the mass of work the making of the later cultures was put off until June, when the cases suddenly ceased. We had intended to test the early and later cultures from the same case for their identity in relation to specific agglutinins. This work is now being undertaken but it was impossible to complete any of the cases in time to make a report at this time.* We can state, however, that in 3 cases of measles the green diplococci persisted up to the tenth, twenty-first and twenty-third day after the appearance of the rash and that so far as cultural appearance could determine, the diplococci which appeared in the first cultures made early in the disease persisted to the final cultures made during convalescence and after. (See Table V.)

If further investigation proves them to be identical it would require conclusive proof to make us accept them as the cause of measles, for it is well established that cases of measles are not communicable at such a period after convalescence and we have no knowledge of such a rapid loss of virulence in convalescence.

TABLE V

SHOWING PERCENTAGE OF GREEN STREPTOCOCCI IN CULTURES FROM CONVALESCENT MEASLES

		Eye		Nose		Tonsil	
Case Number	Days Convalescent	Amount Growth	Per cent Green	Amount Growth	Per cent Green	Amount Growth	Per cent Green
98.....	6	+	100	+++	0.1	+	100
	8	+	100	+	100	No growth	
	21	+	90	+	75	+++	95
99.....	11	++	95	++	90	++	99
	16	No growth		±	95	±	99
	23	+	45	∓	25	+∓	50
100.....	6					∓	50
	14					+∓	50
101.....	3					±	100
	7					∓	50
	10					±	100

± = Scant growth. + = Moderate growth. ++ = Abundant. +++ = Profuse.

Drs. Tunnicliff and Ferry both claim that, when the toxin or toxin and dead organisms are used in proper dilution in intracutaneous tests, they are diagnostic between immunity and lack of immunity to measles.

We have observed the results of tests in hundreds of young children, some of whom have had measles and some of whom have not and we have been unable to obtain distinctive results. Dr. Schroder and Dr. Zingher have obtained very similar results in the children tested by them.

* October 13, 1926.

TABLE VI

TESTS MADE WITH TUNNICLIFF MEASLES TOXIN, WILLARD PARKER

Case	Age	Toxin 1:20 3	Dilutions 1:40 3	Toxin 1:10 aa Convalescent Serum 1:2	Broth Control 1:20
		"Susceptibles"—*i.e.*, those who never had measles			
1	4 years	1 x 1 P	1 x .7 PP	.8 x .8 P	
2	16 months	.4 x .4 P	.4 x .4 P	1.5 x 1.5 P	.5 x .4 P
3	2 years	.4 x .3 P	.3 x .3 P	.5 x .5 P	.2 x .2 P
4	15 months	1.5 x 1.5 P	1 x 1 P	.6 x .6 P	.5 x .5 P
5	14 months	.5 x .4 P	.7 x .6 P	.5 x .6 P	.3 x .4 P
6	4 years	1.5 x 1.5 P	.2 x 2 P	.5 x .5 P	
7	6 years	.5 x .6 PP	.3 x .3 PP	.9 x .9 P	
		"Non-susceptibles"—*i.e.*, the following children give a definite measles history			
1	3 years	1.2 x 1.1 P	.9 x 1.1 P	2.5 x 2.5 BP	
2	2½ years	.7 x .8 P	.5 x .6 P	.6	
3	2½ years	1.2 x 1.3 P	.7 x .8 VPP	1.5 x 1.7 PP	.5 x .4 P
4	2 years	.5 x .5 P	.4 x .4 P		.2 P
5	1 year	1.2 x 1.2 P	1.5 x 1.6 P	1.5 x 1.4 P	
6	3 years	.2 x .2 PP	.2 x .2 PP	.6 x .7 P	
7	4 years	1.5 x 1.5 P	.4 x .5 PP	1 x 1.2 BP	

The tests were read 18 hours.
P=Pink. BP=Bright Pink. PP=Pale Pink. VPP=Very Pale Pink.
1.2 x 1.5=1.2 centimeters by 1.5 centimeters.

Three years ago with Freeman and Valentine we tried to see if it were possible to get in some medium the development of some toxin in cultures from filtered nasal secretion of early cases of measles. In only one case did we get a toxin, and this curiously enough was in a culture in which a diplococcus like the Tunnicliff diplococcus had passed the filter. This gave us fairly distinctive differences between susceptible children and those who had recently recovered from measles. Those who had not had it recently reacted quite irregularly.

It seemed to us, therefore, that there might have been some reaction to the toxin of the diplococci in the blood and in the respiratory passages but that this in no way proved that they were the original etiological factor. Table VI gives a characteristic test. It is seen how irregular the reactions were. Certainly they would not suffice to test the immunity of the children. There was practically no difference between the two groups. Similar results were obtained with the Ferry toxin.

EFFECT OF INTRACUTANEOUS INJECTIONS OF THE SERUM OF IMMUNIZED GOATS

Tunnicliff described the result of injecting her diluted immunized goat serum intracutaneously into children before the measles rash has developed and notes that just as has been shown to occur with convalescent measles serum, the injection of serum from goats which have received injections of her diplococcus antigen inhibits the development of the rash. Long before her paper appeared we had tried her goat serum, the Ferry serum and serum from goats immunized with our strains intracutaneously in children. Our strains were from cases in the Koplik spot period. The results with all these serums were striking and for a time we felt that we had strong evidence as to the specificity of the diplococci. In scarlet fever in which intracutaneous injections of convalescent human serum or of

TABLE VII

MEASLES EXTINCTION TESTS

Number of Case	Human Measles Convalescent Serum 1:10	Goat Serum Our Strains 1:10	Goat Serum Tunnicliff Strain 1:10	Goat Serum Ferry Strains 1:10	Control Animal Serum 1:10	Control Animal Serum 1:10
5	2. x 2. F	2. x 2. M			3. x 3.5	1.5 x 1.5 F
6	4. x 5.	4. x 3.			3. x 4.	
9	4. x 5.	3. x 3.	2. x 3.	4. x 3.		
4	3. x 3. M	3. x 3. M	3. x 3.			
9	4. x 5. M	3. x 3.	2. x 3.	4. x 3.		
12	4. x 4.	3. x 3.		1. x 1.		

F=Faint blanching. M=Marked blanching.

antitoxin developed in the horse blanches the developed rash we think is due to a direct antitoxic action. In preventing the development of the measles rash we are less certain that this is a specific antitoxic reaction. Having obtained these striking results we tried as controls the serum of a goat which had been immunized to scarlatinal streptococci and one which had received diphtheria bacilli and one which had received so far as known no injections. The results were surprising. The serum from one of the control goats, when given intracutaneously, inhibited the rash almost as well as did the convalescent measles serum or the Tunnicliff serum and two of the others had definite but not so decided action. Some of these tests are shown in Table VII.

These surprising results throw doubt on the value of the measles rash extinction tests as indicating a specific neutralization of toxin.

We close our paper at this point since we have had no experience with cultures reported upon by Caronia or Degkwitz. The results obtained by Degkwitz have impressed us very strongly and we hope to try and corroborate his findings in the near future.

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1. Tunnicliff, Ruth. The Cultivation of a Micrococcus from Blood in Pre-Eruptive and Eruptive Stages of Measles. *J. A. M. A.*, 68, 14:1028 (Apr. 7), 1917.

2. Ferry, N. S., and Fisher, L. W. Measles Toxin. *J. A. M. A.*, 86, 13:932 (Mar. 27), 1926.

WATCH for these in the June JOURNAL:

THE MONEY VALUE OF LIFE AND LIFE EXTENSION
Louis I. Dublin, Ph.D., and Alfred J. Lotka, D.Sc.

MEASLES IMMUNIZATION
D. L. Richardson, M.D., and Harmon P. B. Jordan, M.D.

THE SCORING OF 57 NEW YORK STATE CITIES
Huntington Williams, M.D., Dr.P.H.

THE ACCURACY OF BACTERIAL COUNTS FROM MILK
Robert S. Breed

CORRELATION OF INFANT SALVAGE WITH NURSING EFFORT
MEASUREMENT OF THE EFFICACY OF PUBLIC HEALTH NURSING
J. Rosslyn Earp, Dr.P.H.

REPORT OF THE COMMITTEE ON TRAINING AND PERSONNEL

PUBLIC HEALTH ENGINEERING IN EUROPEAN COUNTRIES*

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ENGLAND is the home of public health engineering. In that country such activities date back prior to the germ theory of disease and also antedate substantial accomplishments in this field elsewhere. Administrative practice has had much to do there with the history of public health engineering. This is particularly true in view of the fact that the Local Government Board of England had for a great many years jurisdiction over problems relating to sewerage, sewage disposal and river pollution, and over their bearing upon water supply projects and the disposal of industrial wastes. In 1919 this jurisdiction was transferred to the Ministry of Health.

JURISDICTION OF MINISTRY OF HEALTH

In England no local authority can issue bonds with which to pay for the construction of works related to these activities without making application to the Ministry of Health, which conducts public hearings and authorizes loans under stated conditions. The only exception to this rule is found among some of the larger municipalities, which are able to meet the expense of going directly to Parliament to secure enabling acts for the enterprises which they desire to carry forward. This is interesting to American engineers, who for some years past have encountered increasing jurisdiction on the part of authorities in different states and provinces; but except in the case of Massachusetts, have not found jurisdiction so extensive as that of the Ministry of Health and its predecessor, the Local Government Board.

This English practice dates back to the Public Health Act of 1875. This was followed in 1876 by the Rivers Pollution Prevention Act, setting up a very high standard for the quality of the then highly polluted English rivers. Little was done, however, for a dozen years until legislation was passed establishing Rivers Boards having jurisdiction under the Local Government Board over all matters of pollution by sewage and industrial wastes in given areas. Splendid accomplishments have followed the activities of these Rivers Boards, particularly in the manufacturing areas of England; with the result that the great majority of municipal and industrial plants are giving substantial treatment to their wastes.

In their lower reaches it is the intention that the relatively small English rivers shall be free from putrefying objectionable conditions so far as gross offense is concerned. However, it is not the intent to make the main streams suitable for drinking waters which are generally derived either from underground sources or from upper reaches of the streams. Where drinking waters are taken from the lower reaches, as in the case of portions of the London supply from the Rivers Thames and Lea, it is interesting to note that special Conservancy Boards have jurisdiction over stream pollution.

The Ministry of Health of England has jurisdiction over certain housing activities

* This is the last of a series of papers on International Activities in Public Health Engineering, from the Fifty-fifth Annual Meeting of the American Public Health Association at Buffalo, N. Y., October 11, 1926. Papers by Victor G. Heiser, F. F. Longley, E. H. Magoon, and Louis Cantor have been published in the Journal.

and has made notable progress in its supervision of collection and disposal of refuse, which practically without exception comprises a mixture of garbage, rubbish and ashes.

PUBLIC HEARINGS

Public health engineering in England derives benefit from many inquiries or public hearings directed to bring out most thoroughly various local viewpoints surrounding any particular project. From a technical standpoint coördination of viewpoints is advanced not only by hearings on specific projects but by less formal inquiries carried forward through special committees upon which are represented central, regional and local governmental agencies as well as various interested parties.

Health authorities encourage meetings of associations of workers in the public health field and there is much less difficulty in England than in America in having engineers, as representatives of the local authorities, attend various national meetings with their expenses paid by their local authorities. Through this channel valuable data on costs of public health engineering works have been assembled. Such cost data are particularly noticeable in regard to refuse disposal, through the activities of committees of the Institute of Cleansing Superintendents.

The assembling of similar data as to cost of constructing and operating sewage treatment works is being forwarded by a committee of the Association of Managers of Sewage Disposal Works.

PROJECTS SINCE THE WAR

Since the war sewage treatment projects have gone forward in England with substantial activity; due partly to the fact that little or nothing was done along this line during the World War, and also partly to the financial aid rendered by the central government in building needed sewerage systems and sewage treatment and refuse disposal plants in connection with the solution of its unemployment problem.

Most of the surface water supplies of England are filtered through slow sand beds. Mechanical filters have been recently installed in the London District as preliminary filters, placed between large storage basins and the sand beds built many years ago. There are a limited number of mechanical filters making use of coagulant and operating independently of slow sand filters. Mechanical filters are also used for decolorizing some of the peaty waters in the north, particularly for the Edinburgh supply. The use of lime and other means for eliminating corrosion have been practiced.

Chlorination of English water supplies is rarely practiced except in cases of emergency.

FRANCE

Most of the French water supplies are taken from underground sources. Sewage for the larger communities is disposed of on sewage farms, many of which have been outgrown. All sewage disposal projects in France have to meet the approval of the Superior Council of Public Health. The French Parliament has passed specific laws upon which are founded the more notable public engineering works for Paris and other sizeable cities.

HOLLAND

During the past few years the central government has established a bureau which deals with the design, construction and operation of sewage disposal plants for treating the wastes of municipalities and industries. The purpose of this bureau is to set up a jurisdiction for improving the performance of local authorities, particularly in respect to the protection of shellfish layings and bathing beaches. There is a similar bureau for water supply.

Chlorination is used to some extent in Holland, and is well thought of. There are no novel features in public health

engineering practices, although it is perhaps interesting to note that engineers have developed much skill in handling ground water supplies in that country.

SWITZERLAND

The individual state or canton seems to be more of an administrative agency on public health questions from the engineering standpoint than the central government. At least that has been found true in the matter of sewage disposal where the prevailing viewpoint is to divert pollution from water supplies, which supplies are usually taken from the mountain lakes or springs and frequently without filtration.

At the well known Zurich waterworks there is a double filter plant which has been built quite recently. It is interesting to note that this plant has mechanical filters for preliminary treatment followed by slow sand beds. The water comes from Lake Zurich at a substantial depth. Marginal sewers protect the supply against pollution. Double filters are required to avoid complications from plankton growths in the clear lake water. Chlorination is not used.

GERMANY

The Imperial Health Board has been continued under the Republic. Its jurisdiction over public health engineering matters is likewise limited to nation-wide problems in case of emergencies such as epidemics, particularly as related to the pollution of interstate streams. The individual state has jurisdiction in Germany over most public health engineering problems, as is the case in our own country.

PRUSSIAN INSTITUTE OF HYGIENE

The best known central authority is that of Prussia which has had an Institute of Hygiene for more than 25 years carrying on various activities related to public health matters. The bureaus of the institute include those of engineering, chemistry and biology. The institute advises the cabinet officers in matters related to the public health, including in some instances questions as to the authorization of loans by local authorities. Its activities relate largely to the educational aspects of public health work; in that the Prussian Institute at Berlin conducts lecture courses at which engineers and health officers of municipalities and districts attend from time to time in order to become familiar with current developments in their lines of activity.

One of the most important activities of the Prussian Institute is to become familiar with the sound basic data of various problems which arise within its jurisdiction. Just before the World War it established in one of the suburbs of Berlin new quarters amply provided with laboratory and demonstration facilities. The scope of this institute has broadened during the 25 years of its life, so that now it not only deals with problems of water supply and sewage disposal but also with problems dealing with pollution of air and of the soil.

EMSCHER AND RUHR DISTRICTS

No reference to German practice would be complete without mention of the excellent work in the Emscher and Ruhr districts, about which Americans have learned so much from time to time through the writings and visits of Dr. Imhoff. From the administrative standpoint these drainage districts are set up perhaps more effectively than in any other place in the world, in that they give direct representation to municipal and industrial concerns related to a given pollution question so that those whose money is to be spent have a voice in mapping out an orderly program for installation through a term of years. This direct representation of industrial concerns on drainage district boards has some advantages over the organization of the Rivers Boards of England, where the industries secure representation on administrative boards only by indirection through having some one of their group who is a member of a city

or town council chosen to serve on the Rivers Board.

CHLORINATION

In Germany it is interesting to note that chlorination is practiced at a number of waterworks plants, particularly for the well water supplies of Essen when floods cover the meadows in which the wells are located. At Hamburg and some other places chlorine is said to be used during recent years in connection with slow sand filters, largely on account of lack of funds with which to pay for coagulants to be applied to the large settling basins in front of the filters.

Generally speaking, since the World War, relatively few plants pertaining to public health engineering have been built in Germany.

AMERICAN CHILD HEALTH ASSOCIATION

ANNUAL MEETING

A FEATURE of the Annual Meeting of the American Child Health Association in Washington, D. C., May 9–11, headquarters Willard Hotel, will be the participation of 11 distinct organizations working in the interest of children. This session is planned for Tuesday, May 10. Dr. William F. Snow, president of the National Health Council, will describe present trends as viewed by the national professional associations. The Child Study Association, the Junior Red Cross, Boy Scouts and Girl Scouts Organization will be represented.

Herbert Hoover, president of the American Child Health Association, will officially open the annual meeting Monday morning, and the speakers will be William Green, president of the American Federation of Labor, and Dr. S. J. Crumbine, general executive, American Child Health Association.

The gains made in health promotion during the Twentieth Century will be reviewed Monday afternoon by Dr. Philip Van Ingen, secretary, American Child Health Association and clinical professor of the diseases of children, Columbia University; Bailey B. Burritt of the Association for the Improvement of the Condition of the Poor, New York City; Mabelle S. Welsh, director, East Harlem Nursing and Health Center, New York City, and Edna White, Merrill Palmer School, Detroit, Mich.

The presidential address will be delivered Monday evening in the U. S. Chamber of Commerce Building. Following Mr. Hoover's address, Dr. John Anderson, director, Institute of Child Welfare, University of Minnesota, will speak on "The Community and the Child," and Dr. Vernon Kellogg, director, National Research Council, on "Determining the Normal."

"The School Child" will be the subject of the Tuesday evening meeting with Dr. Thomas D. Wood, professor of health education, Teachers College, Columbia University, presiding. Speakers will be Dr. Borden S. Veeder, St. Louis, Mo.; Dr. Harold K. Faber, professor of pediatrics, Stanford University, and Dr. Louis I. Dublin, of the Statistical Bureau of the Metropolitan Life Insurance Company. Dr. Faber will give the results of the 3 years' study of San Francisco's school health program.

At the Wednesday noon luncheon Professor Murray Horwood, Massachusetts Institute of Technology, will talk on "The Measurement of Progress in Health Work."

The official health organizations will occupy the Wednesday morning session with Surgeon General Cumming presiding. In addition to representatives from the federal agencies including the Public Health service, Bureau of Education, the Children's Bureau and the Department of Agriculture there will be speakers from either the health or education departments of Minnesota, Indiana, Connecticut, Virginia and the District of Columbia.

A symposium, "Teaching Health to Medical Students" is scheduled for the closing session Wednesday. The speakers will be from the pediatric departments of Washington, Harvard, Stanford, Virginia, Georgetown and Columbia Universities.

Mrs. Hoover will be hostess to the delegates at a tea at her home Tuesday afternoon.

The usual fare reductions have been granted on most of the railroad lines.

PUBLIC HEALTH ASPECTS OF FOOD PRESERVATION *

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THE PRESERVATION of food is a major industry in nearly every country. The reasons for this are obvious. Agricultural raw food products attain their prime and maturity at different seasons, others are produced only in certain parts of the country. In some sections there are abundant harvests, in others crop failures. Our population is two-thirds urban. Food must be preserved for the lean seasons, for the non-producers, for the non-agricultural regions and for the purpose of satisfying an omnivorous American appetite for variety in all places and seasons.

GENERAL METHODS OF PRESERVATION

1. Application of heat, such as canning and preserving, pasteurization, evaporation, sun-drying, dehydration and smoking
2. Application of cold, as in cold storage, refrigeration and freezing
3. The use of chemical substances such as salt, sugar, vinegar, benzoic and lactic acids
4. Fermentation, examples being acetic, lactic, alcoholic, etc.
5. Such mechanical means as vacuum, filtration and clarification processes, devices or agents for preventing chemical deterioration or bacteriological spoilage (The use of oil, paraffin and waterglass are included here.)
6. Combinations of two or more of the above

HEALTH ASPECTS OF PRESERVATION BY HEAT

Probably preservation by heat is the most important of all these methods because on it are based the immense canning, beverage and drying industries.

The raw products for the food factory must be mature, sound, and free from filth. Fruits, vegetables and marine products should be carefully washed in a clean building provided with modern sanitary devices. Raw products may be contaminated with harmful organisms. Thorough sorting and cleaning materially reduces the number of microörganisms passing into the container before sealing and thus further reduces their chance of survival after processing.

Much has been written [1, 2, 3] concerning both cannery sanitation and the physical examination of workers in food factories. The former is absolutely necessary, the latter, highly desirable. The attempt has been made to point out that inasmuch as food is sterilized in tin cans or glass jars, that the methods of preliminary handling are relatively unimportant. Although it is true, and fortunately, too, that the high temperatures used to process canned foods do destroy practically all living microörganisms, the chance of survival increases with the initial contamination. Furthermore, unclean, mangled, or partly decomposed foods make a very poor appearance in the can and sell at low prices.

That sanitation is a factor in the production of sound and safe canned foods there appears to be no doubt. Nearly all states now possess suitable sanitary laws applicable to food manufacturing plants and what is better still, considerable effort is being made to enforce them. The milk sanitarians long ago found that pasteurization without inspection at the source was often taken by the producer as a

* Read before the Food and Drugs Section of the American Public Health Association at the Fifty-fifth Annual Meeting at Buffalo, N. Y., October 13, 1926.
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license to produce dirty, low grade milk. The processing of canned foods acts in much the same way as the pasteurizing of milk. It is a final check, though of course in the case of foods the hermetically sealed can or jar prevents recontamination.

EFFECT OF PROCESSING

Probably the most important point of all in canning and preserving is the temperature of the process or cook and how long this is maintained. Thanks to the many careful investigations already carried out in this field, canners now have at their disposal sufficient information to enable them to pack and market a high grade of canned foods upon whose wholesomeness the public may safely depend. The trend[8] in botulism outbreaks is downward and with a greater proportion each year due to home packed foods. Education as to the necessity of properly processing vegetables, meats and fish to avoid the possibility of food poisoning, should be carried to the home. Most commercial packers are now doing everything within their power to lessen the dangers of food poisoning from commercially canned foods. The presence of *Cl. botulinum* in soil or dust almost everywhere makes it necessary to process non-acid vegetables, meats and marine products and cereals, at a temperature which precludes the survival of any spores. In the case of meats, marine foods, and non-acid vegetables it has been found unsafe to process or cook at the temperature of boiling water (212° F.). For safety, a pressure cooker is necessary. By acidification with organic acids, it is possible to secure sterility at 212° F.

The aim of the commercial packer is sterility in his finished pack—this end has been practically attained in the case of canned fruit and some vegetables. Some other canned foods contain viable bacteria, which, though probably harmless, are more resistant to heat than even the bacillus of botulism.

It is now known that many of our canned vegetables, meats and marine foods are not sterile.[4, 5, 6, 7] Furthermore, it is almost impossible to prevent occasional poor seams resulting in leaky cans, mistakes in processing, or other accidents. A cannery is a very busy place. That more mistakes are not made has always been a marvel to me.

UNSAFE CANNING LITERATURE

One very serious situation, it seems, has been entirely overlooked. This concerns itself with the large number of books, bulletins, circulars, recipes, and canning guides which are sadly out of date and which describe faulty and positively dangerous methods of canning vegetables, meats and fish.

The writer has personally investigated at least two fatal outbreaks of botulism which were directly traceable to erroneous canning directions. Something should surely be done to curb the publication and distribution of such dangerous literature. At this time much credit should be given to the Bureau of Home Economics, U. S. Department of Agriculture, for their courage in adopting safe and sane methods of canning and distributing them in bulletin form[9] to replace former ones which were decidedly objectionable from a public health viewpoint. Likewise the Bureau of Chemistry, U. S. Department of Agriculture, the National Canners' Association and certain states, notably California, have carried on excellent publicity campaigns for the enlightenment of canners and consumers alike.

OTHER FACTORS

It was feared and even openly stated some years ago that the process of canning destroyed the vitamins of the raw products. The excellent researches of Eddy and Kohman[10] and others have all fully demonstrated that canned food retains nearly all of its original vitamin content.

As to the adulteration of canned fruits and vegetables, there is little to be said

primarily because much of the adulteration which occurs, for example the substitution of apple pectin in berry jellies, tomato juice for tomatoes, and many others, do not have much public health bearing. The suppression of decomposed foods and those containing added harmful preservatives, is a laudatory work and one well done by state and federal authorities.

Savage[5] in England has claimed that the toxins of the Gaertner and similar bacilli are at times thermostable and produce symptoms of poisoning even though the canned food be sterile. He reported the presence of toxin in canned marine products and meats. This is a very interesting as well as important field. Geiger and his associates[11, 12] likewise have reported the formation of toxins which withstand a degree of heat. The whole paratyphoid-enteritidis group of bacteria need thorough study, particularly in their relationship to food poisoning.

It is known that there are certain infections and dermatoses caused by handling some foods in canneries. Both tuna and pears cause a distressing dermatitis among some workers, while staphylococcic infections are common among fishermen and other workmen handling marine products. In certain sensitive individuals, hay fever and protein sickness may be caused by handling fruit or other foods.

Industrial accidents in food factories will merely be mentioned here. Let it suffice to say that such accidents in canneries and beverage plants are common enough, though seldom of a serious nature. The various state labor and industrial commissions have done excellent work in the protection from accidents and in the improvement of working conditions of factory employes.

Perhaps it should be mentioned here that in most states the 8-hour day law for women workers is not enforced in factories packing perishable foods. This non-enforcement may result in the impairment of the health of some of the women, for surely the work is as trying as other labor.

UNFOUNDED PREJUDICE

There is a deep-seated prejudice against canned foods, especially in the minds of older people and in certain sections of the country. Thousands of cases of illness have been wrongfully attributed to them.[11, 13] They have been merely a convenient peg upon which the unknown cause of the illness could be hung. It is probable that canned foods are among the safest that are consumed.

The old "ptomaine" theory of food poisoning has been relegated to the past as modern researches have demonstrated that most decomposition products are relatively harmless, and that nearly all acute gastrointestinal disorders are due to specific bacteria. After all, the total number of deaths from botulism is insignificant when compared with even rare or extraordinary causes of death.

TIN CANS AND GLASS JARS

The writer has found[14] that empty cans and jars before use contain at times very large numbers of microörganisms besides dust and other debris. Many canners do not wash their cans previous to use, though most glass packers and bottlers do. Many cans or jars contained from a few hundred to over 200,000 microörganisms comprising many species. Some of these were very heat-resistant sporulating bacilli such as are often found in insterile canned foods. That the source of some of these is the unclean container, there is no doubt. It may well be that such organisms as *Cl. botulinum* are present in these cans. It is possible that the two recent outbreaks of botulism[15, 16] attributed to canned sardines were contaminated in just this manner, for so far as is known to me this organism has not been encountered in sea water. Food officials should insist on all food containers being thoroughly washed previous to use. Wisconsin has already taken a lead which other states may well follow.

As to the supposed dangers of dissolved tin and iron in canned foods, we have no reliable data to substantiate such claims.[9] Tin plate used for can manufacture is lead-free. Lead solder is never used in contact with the food. Even where corrosion is marked it is probable that as long as the contents are palatable, there need be no fear of metallic poisoning.[13]

Although British investigators[18] have called attention to the presence of glass particles in foods packed in glass, they also report that certain foods may dissolve arsenic, lead or boric acid from the glass, thus creating further objections. Until these results have been adequately checked in this country we cannot but believe that there is no great danger arising from the use of modern glass containers in the food packing industry.

Struvite crystals (magnesium ammonium phosphate) have been found rather commonly in canned shrimp, crab and salmon.[19, 20] In a number of instances these hard gritty masses have been mistaken for glass. The substance is entirely harmless and appears to be a natural constituent of some canned foods.

An interesting sidelight is the prevailing idea that canned foods must be removed from the container immediately upon opening. Even many labels tell the purchaser to do this. At least two states, Oregon and Kansas, have regulations prohibiting the use of tin cans for food storage or cooking. As a result of a circular letter addressed to about 50 commercial canners, not one gave a sound reason for such a statement. There is in fact no good reason for emptying the can contents immediately. It would appear that if only a portion is to be consumed that the cleanest and safest place for the remaining portion for a day or so is in the original container.

DRYING AND DEHYDRATION

Sun drying as well as artificial dehydration is a widely-used method of preserving fruits, vegetables, fish and meats. The practice is much more commonly utilized in the Orient and in Europe and Africa, than in this country. There are few important public health aspects of drying. The handling of the product both during and after drying may contaminate the food. Of course, only sound raw products should be used to begin with, and they should be handled in such a manner as to preclude contamination. Vermin, flies and filth must be rigorously excluded. Our native dried raisins, figs, prunes, apples and fish are, in general, carefully prepared and provide an excellent and safe food for the American public. This is more than can be said for such imported dried products as Symrna figs, Greek currants or Algerian dates. Many shipments of these are very dirty and badly infested with insects. The sulphuring of dried fruits has long been practiced. Whether or not sufficient sulphites remain in the fruit to constitute a health hazard is debatable.

The modern method of packing and marketing dried fruits and vegetables in sealed paper or metal containers is a very commendable practice.

COLD STORAGE

Many states now have adequate cold storage laws. Cold acts as a deterrant to microbial action and there has been little danger to the public health from this class of foods. Millions of pounds of cold-packed fruits, frozen fish and meats, cold storage butter and eggs are annually consumed not only without injury but of unmeasured benefit to our national health.

Here again only sound, fresh foods should be placed in cold storage or frozen, since spoilage rapidly takes place upon removal to ordinary temperatures. It is known that members of the typhoid group may survive long periods of time in ice, ice cream or in other frozen products and for this reason great care must be taken not to refrigerate or freeze contaminated raw products.

SUGAR, SALT, VINEGAR AND OTHER CHEMICAL SUBSTANCES AS PRESERVATIVE AGENTS

Methods of preservation of food by the use of salt or vinegar are very ancient. The use of sugar is a relatively later practice though now widely prevalent. There are few organisms capable of withstanding the ordinary concentrations of sugar, salt or vinegar used in food preservation, and few cases of illness have been reported due to the eating of such substances as green olives, pickles, kraut, preserves, jellies, syrups, citron or candied fruits. Only clean sound products should be pickled or salted and care must always be taken that sufficient concentration of the preservative is present to prevent spoilage. Likewise, ordinary common sense precautions will guard against contact contamination upon removal from the brine, pickle or syrup.

Here mention must be made of the use of harmful preservatives such as borates, salicylates, and formates. They are now rarely found in food products. A new preservative, so far as I am aware, was our discovery of last year in Seattle of hexamethylenetetramin (urotropin), in imported Japanese and Siberian caviar. This is a most unusual substance which forms formaldehyde only if decomposition of souring occurs. Benzoate of soda, alum, nitrites and other agents concerning the harmfulness of which there is well divided opinion, are legally used in our foods and are undoubtedly of some public health significance, particularly when considerable quantities are consumed.

There has been considerable adverse criticism[21, 22] given the recent decision[23] of the Federal Bureau of Animal Industry permitting the use of nitrites in meats without declaring their presence. The use of hypochlorites in ice[24, 25] for refrigeration and preservation of fish and other foods is effective and harmless. Carbon dioxide ice is likewise without objection.

PRESERVATION BY FERMENTATION

Since the enactment of the National Prohibition Act we have very little alcoholic fermentation being legally carried on in this country. There is, however, a great deal of illegal brewing and distilling. The use of copper and zinc stills and containers has caused much trouble because of the solvent action of the fruit, vegetable or cereal mash. Many cases of heavy metal poisoning have been attributed of late to this source.

The consumption of green and improperly fermented liquors containing aldehydes and higher alcohols is undoubtedly a question of major public health significance. On the other hand there are few public health phases concerning the legitimate fermentation industries.

PRESERVATION BY VACUUM, FILTERING ETC.

Inasmuch as these preservation methods are usually practiced in connection with other methods no peculiar public health problems have presented themselves.

SUMMARY

To summarize, the principal methods of food preservation are canning, pasteurizing, drying, smoking, cold storage and freezing, use of such substances as salt, vinegar, sugar and chemical preservatives, fermentation, mechanical agents and combinations of these.

The principle of using sound, fresh and clean raw products is essential to the success of all methods of preservation. Likewise clean, disease-free workmen handling the food in a sanitary manner, in clean surroundings is another essential common to every method.

Similarly after the process, all preserved foods must again be protected against extraneous contamination. By far the most important methods in commercial use are the use of heat in canning, pasteurizing, smoking and drying foods. The principal public health aspect of canning lies in the destruction of possibly

harmful bacteria by a process or cook of sufficiently high temperature and held for a sufficient length of time. Although some sound canned foods are not sterile, this is no cause for alarm because of the harmless character of nearly all these organisms. Botulism outbreaks are rare and are confined chiefly to home canned foods, though commercially canned foods are occasionally implicated.

It has been pointed out that all empty containers should be thoroughly cleaned before packing food therein due to danger of introducing resistant and harmful organisms by this means.

Occupational accidents, dermatoses and infections due to handling certain foods and non-enforcement of the 8-hour laws for women in canneries are additional public health phases of the preservation industry.

The presence of thermostable toxins of the paratyphoid-enteritidis group in canned foods has been reported, but the data are not yet sufficiently convincing to state with certainty just how serious this menace may be.

Many decomposed products aside from being offensive and repulsive to the senses, do not have the public health significance formerly attributed to them.

Researches have proved that the vitamins, particularly the antiscorbutic factor, are not greatly injured in the process of canning foods. From a health standpoint, this is a very important finding to the entire nation.

The canning guides, bulletins, circulars and recipes distributed by state agencies, magazines, women's clubs and manufacturers of canning equipment contain many erroneous statements and faulty methods which have been directly responsible for several outbreaks of botulism besides causing great losses through spoilage of good human food. Accurate and safe directions for preserving food products should be prepared by state colleges, and similar agencies in order that any present faulty, unsafe methods may be rectified.

Adulteration of canned, dried or smoked food is at present of minor significance from a public health standpoint. This is due largely to excellent law enforcement by the several federal and state food officials.

Dried foods and cold-stored foods likewise present few public health problems.

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INFANT MORTALITY AS SHOWN BY CANADIAN VITAL STATISTICS*

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BY WAY of introduction it may be stated that previous to 1919 no serious attempt had been made to establish in Canada a system of vital statistics which would be national in character and uniform as to the scope of information collected. In that year, as the result of a series of conferences held between the Dominion Bureau of Statistics and the registrars general of the different provinces, a scheme of national vital statistics was launched. The plan, in short, was that the registration of births, deaths and marriages should be made in all provinces on a uniform basis. For the first 5 years the Registration Area comprised only 8 provinces. Now all Canada is included in the scheme.

The present paper, therefore, deals only with those aspects of infant mortality disclosed by the records of the 5 years 1921 to 1925 for what then was known as the Registration Area, comprising the 8 provinces whose legislation on vital statistics conformed to the principles of the Model Bill and which collected the information according to forms approved and supplied by the Dominion Bureau of Statistics.

A comparison between the number of infants under 1 year of age recorded in the Census of 1921 and the survivors computed from the birth and death registration during the 12 months preceding the last census, from June 1, 1920, to May 31, 1921, may serve to give some indication of the completeness of registration. It was assumed in the computation that the infant deaths of these 12 months in each province contained the same proportion of children born within the period as was shown by actual count for the year 1923. For the whole Registration Area in the latter year this proportion was 76.2 per cent. The census figures with which comparison was made were those of infants under 1 year of age born in Canada. This assumes that the number of immigrant children under 1 year of age recorded in the census for the Registration Area (1,336) was not balanced by emigration of children born in the 12-month-period for which registration is tested. Whatever error lies in this assumption tends to minimize the incompleteness of registration, but can have no great effect. Another assumption in the computation is that all the infant deaths are of children born in Canada. The error here is even smaller than in the preceding case and moreover tends in the opposite direction. It is noted that the under-enumeration of children under 1 year of age in the United States Census has been estimated at about 9 per cent for white infants. The Census of England and Wales in 1911 shows a deficit of about 6 per cent and in 1921 of somewhat less than 4 per cent as compared with the number of survivors computed from birth and death registration, which in that country is presumably almost complete. Owing to similarity of conditions in Canada and the United States the estimate of 9 per cent of under-enumeration has been applied to the Canadian Census of 1921 in the following manner:

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-fifth Annual Meeting at Buffalo, N. Y., October 12, 1926.

Canadian-born infants enumerated in the Registration Area at the Census of 1921	143,680
Estimate of number of such infants living in Registration Area, if all had been enumerated	157,890
Total deaths under 1 year registered in Registration Area, in the 12 months, June, 1920, to May, 1921	16,234
Estimated number of deaths of those who were born in same 12 months	12,351

Adding the last figure to the estimate of living children we have a total of 170,241 as the computed number of living births during the 12 months from June, 1920, to May 31, 1921, inclusive. The number of births registered for this period was 164,516 so that the number not registered may be calculated as 3.4 per cent of the total. In this computation there are some arbitrary elements, as noted. However, it appears safe to assume that for this period, about half of which was in the first year and half in the second year of the national system, registration of births was well within 5 per cent of completeness for the Registration Area as a whole. Assuming the correctness of the computation, no improvement in birth registration even to the point of perfection could effect a reduction in the infant mortality rate in excess of 3.4 per cent, which at any level obtaining since 1921 would mean less than 3 deaths per 1,000 births. The results obtained were not uniform in all provinces. It must be remembered, however, that the extent of under-enumeration in the census was not likely to be the same in all provinces.

As the infant mortality rate is computed on the number of living births it may be useful in passing to glance at the birth registration for the years under review. The absolute number of births in 1924 showed a slight increase over the preceding year, but this is the only exception to the rule that every year since 1921 has shown a smaller number of births than the year immediately preceding. The number for 1925 (154,509) marked a reduction of more than 3,000 births from 1924 (157,595), more than 2,000 from 1923 (156,897), more than 9,000 from 1922 (164,194), and more than 14,000 from 1921 (168,979).

TABLE I

ESTIMATED DEFICIENCY IN BIRTH REGISTRATION BY PROVINCES OF THE REGISTRATION AREA FOR THE 12 MONTHS ENDING JUNE 1, 1921

	Infant Population June 1, 1921		Infant Deaths Registered June, 1920–May, 1921		Births During 12 Months June, 1920–May, 1921		
Province	Infants Enumerated Census 1921 A	Computed Infant Population June 1, 1921, Allowing 9% Deficiency in Census B	Deaths of Infants Registered June, 1920, to May, 1921 C	Computed Deaths from Births of Same 12 Months D	As Computed E	As Registered F	Excess or Deficiency of Registration G
Prince Edward Island	1,840	2,022	198	137	2,159	2,186	+ 1.3
Nova Scotia	12,214	13,422	1,514	1,120	14,542	12,843	—11.7
New Brunswick	9,232	10,145	1,495	1,121	11,266	10,679	— 5.2
Ontario	60,501	66,485	7,115	5,407	71,892	72,363	+ 0.7
Manitoba	14,871	16,342	1,774	1,331	17,673	17,849	+ 1.0
Saskatchewan	20,363	22,377	1,982	1,526	23,903	22,071	— 7.7
Alberta	14,746	16,204	1,546	1,221	17,425	16,191	— 7.1
British Columbia	9,913	10,893	610	488	11,381	10,334	— 9.2
Registration Area	143,680	157,890	16,234	12,351	170,241	164,516	— 3.4

Column B shows the total infant population as of June 1, 1921, after allowing for 9 per cent deficiency in census enumeration.

The number of deaths in Column D for each province is based on the percentage of the total deaths of infants which an actual count in 1923 showed to have been born in the same 12 months in which they died. The number for the Registration Area is obtained by addition of provinces.

The figures in Column E are obtained by the addition of the figures in Columns B and D.

Column F gives the total number of births actually registered for the 12 months ending May 31, 1921.

Column G shows the percentage excess or deficiency of figures in Column F over those in Column E.

TABLE II

LIVING BIRTHS AND BIRTH RATES BY PROVINCES IN THE REGISTRATION AREA OF CANADA, 1921–1925

Provinces	Living Births					Birth Rates Per 1,000 Population				
	1925	1924	1923	1922	1921	1925	1924	1923	1922	1921
Prince Edward Island..	1,672	1,858	1,977	2,160	2,156	19.2	21.1	22.5	24.5	24.3
Nova Scotia	11,400	11,801	11,680	12,693	13,021	21.2	22.1	22.0	24.0	24.9
New Brunswick	10,929	10,717	10,704	11,564	11,465	27.1	26.9	27.0	29.5	30.2
Ontario	70,067	71,510	70,056	71,430	74,152	22.6	23.4	23.2	24.0	25.3
Manitoba	14,866	15,454	16,472	17,659	18,478	23.5	24.6	26.5	28.7	30.3
Saskatchewan	20,488	21,539	20,947	22,339	22,493	25.4	27.0	26.8	29.0	29.7
Alberta	14,924	14,597	15,060	16,163	16,561	24.7	24.4	25.3	27.3	28.1
British Columbia	10,163	10,119	10,001	10,166	10,653	18.1	18.3	18.4	18.9	20.3
Registration Area....	154,509	157,595	156,897	164,194	168,979	23.0	23.7	23.9	25.2	26.4

The infant mortality rate for the Registration Area in the year 1921, the first year for which detailed compilations were made, was 88.1 per 1,000 living births. The rate for 1922 was 86.8; in 1923 it again reverted to 88.1, but in 1924 it fell to 78.5 per 1,000 living births, while the figure for 1925, 78.7 per 1,000, is almost identical with that of the preceding year.

From 1923 to 1924 every province contributed more or less to the reduction of 10.9 per cent in the infant mortality rate shown for the Registration Area. All provinces showed a betterment equal to the average for the Registration Area except New Brunswick and Nova Scotia, in each of which the decrease was only about 3 per cent. Nova Scotia, however, showed a decrease from an infant death rate of 94.7 per 1,000 living births in 1924 to 77.8 or nearly 18 per cent in 1925; New Brunswick maintained its downward trend in the rate, but at a slower pace. Of the remaining provinces, Alberta showed a further decrease of 8.9 deaths per 1,000 or 10.6 per cent, Prince Edward Island and British Columbia slightly bettered their standing of 1924, while Ontario, Saskatchewan and Manitoba failed to maintain the rate of 1924. Nevertheless their rate in 1925 was lower than that in 1921, 1922 and 1923.

Comparing the infant mortality rate of 1925 with 1923, every province showed a lower rate in the later than in the earlier year. In Ontario and Manitoba the decrease was 7 per cent; in Saskatchewan 12 per cent; in British Columbia 17½ per cent; in Nova Scotia and Alberta 20 per cent; in Prince Edward Island 22 per cent, and in New Brunswick 5 per cent. As regards New Brunswick it should be stated that it started in 1921 with a rate of 113.3, which it reduced in 1925 to 100.3 per 1,000 living births.

In comparing the various causes of infant mortality in the years 1921 to 1925 it may be of interest to see what percentage of all infant deaths was contributed by certain causes in these years. Taking the gross deaths in the 5-year period 1921–1925, premature birth and injury at birth accounted for 25.6 per cent of the total; congenital malformations for 6.8 per cent; and congenital debility was given as the cause in 12.4 per cent. "Other diseases of early infancy" (*International List* No. 162)

TABLE III

DEATHS AND DEATH RATES UNDER ONE YEAR OF AGE (EXCLUSIVE OF STILLBIRTHS) BY PROVINCES, IN REGISTRATION AREA OF CANADA, 1921–25

Provinces	Deaths Under One Year					Rate Per 1,000 Living Births				
	1925	1924	1923	1922	1921	1925	1924	1923	1922	1921
Prince Edward Island..	116	133	176	153	180	69.4	71.6	89.0	70.8	83.5
Nova Scotia	887	1,118	1,139	1,239	1,311	77.8	94.7	97.5	97.6	100.7
New Brunswick	1,096	1,098	1,135	1,194	1,299	100.3	102.5	106.0	103.3	113.3
Ontario	5,530	5,418	5,950	5,921	6,763	78.9	75.8	84.9	82.9	91.2
Manitoba	1,184	1,173	1,411	1,669	1,533	79.6	75.9	85.7	94.4	83.0
Saskatchewan	1,659	1,634	1,925	1,913	1,814	81.0	75.9	91.9	85.6	80.6
Alberta	1,123	1,227	1,418	1,475	1,391	75.2	84.1	94.2	91.3	84.0
British Columbia	560	574	668	692	602	55.1	56.7	66.8	68.1	56.5
Registration Area....	12,155	12,375	13,822	14,256	14,893	78.7	78.5	88.1	86.8	88.1

accounted for 4.0 per cent of the total; gastric and intestinal diseases for 14.0 per cent; bronchitis and pneumonia for 12.8 per cent; convulsions, a somewhat unsatisfactory rubric, appeared as the cause in 3.2 per cent; and influenza in 2.6 per cent. Of the epidemic diseases, whooping cough and measles were most fatal, the former accounting for 2.8 per cent and the latter for 0.7 per cent of the total deaths. Tuberculosis, external causes, simple meningitis, hernias and dysentery gave percentages ranging from 0.5 to 1.0. Each of the remaining causes gave a lower proportion.

In a discussion of the trend of infant mortality by causes over a stated period it is first necessary to know the extent to which such comparisons are affected by the variation from year to year in the proportion of deaths from causes listed as "Unknown or ill-defined." The proportion for the Registration Area as a whole thus listed varied from 5.7 per cent of all infant deaths in 1921 to 5.0 per cent in 1922, 3.9 per cent in 1923, 4.0 per cent in 1924 and 3.1 per cent in 1925. The percentage of the total thus assigned was therefore not large enough in any one year to affect seriously the trend of rates for particular causes.

The rate from "premature birth" showed an upward tendency during the 4 years from 1921 to 1924, advancing from 16.5 per 1,000 births in the former year to 19.2 per 1,000 in the latter. The death rate from this cause in 1925, however, declined to 18.7 per 1,000. It will therefore require a longer period of time than 5 years to determine the direction of a trend, if one exists. Injury at birth shows no significant variation during the years from 1922 to 1925 though the rate in each of these years was higher than for 1921. Deaths from congenital malformations which had a rate of 4.9 per 1,000 births in 1921 increased year by year until they attained a rate of 6.5 per 1,000 births in 1925.

The figures for congenital debility registered a steady yearly decline. The mortality rate from this cause which was 13.4 per 1,000 births in 1921 fell to 12.0 per 1,000 in 1922; to 10.2 per 1,000 in 1923; to 8.4 per 1,000 in 1924 and to 8.0 per 1,000 in 1925, a decline of more than 40 per cent in 5 years.

Other diseases of early infancy, under *International List* No. 162, showed the highest rate in 1922 when it was 4.2 per 1,000 births as compared with 3.3 in 1921, 3.8 in 1923, 2.9 in 1924 and 2.5 in 1925.

The mortality rate from diarrhea and enteritis fell from 13.7 per 1,000 births in 1921 to 8.5 per 1,000 births in 1924. This favorable trend was reversed in 1925 when the rate advanced to 10.1 per 1,000 births. The fact that there was a decrease for 4 years out of a 5-year period and a total decrease from 1921 to 1925 of more than 26 per cent, suggests that the decrease was more largely due to a permanent improvement in health conditions than to seasonal influences. Baby clinics, maternal instruction, pasteurized milk, and sanitation, which protected the child and its food from the ubiquitous fly, were all working hard to give the baby a chance to live. Babies were born to live if given a chance.

The death rate from bronchitis and pneumonia was high in all years of the period, reaching the peak in 1923 with 12.4 per 1,000 births. Its lowest rate (9.5) was in 1924. The rate in 1925 was 10.0 per 1,000 living births.

The death rate from influenza showed, as might be expected, violent fluctuations from year to year. In 1923 it reached its maximum with 3.7 deaths per 1,000 living births. In contrast, 1921 and 1924 had very favorable rates from this cause, while the other 2 years occupied an intermediate position.

The rates from whooping cough and measles show considerable variation between successive years. The former reached its highest point in 1923 when 3 infants of every 1,000 born succumbed to this cause while the lowest rate was in the year 1922, 1.7 per 1,000. Deaths from

TABLE IV

INFANT MORTALITY RATES FOR CERTAIN CAUSES FOR REGISTRATION AREA, CANADA, 1921–25

	Causes of Death	1925	1924	1923	1922	1921
7	Measles	0.3	0.9	0.8	0.4	0.5
9	Whooping cough	2.4	2.3	3.0	1.7	2.4
11	Influenza	2.5	1.4	3.7	2.4	1.0
80	Convulsions	2.4	2.4	2.5	3.0	3.2
99, 100, 101	Bronchitis and pneumonia	10.0	9.5	12.4	10.8	11.0
112	Diseases of the stomach	1.2	1.0	1.3	0.3	0.6
113	Diarrhea and enteritis	10.1	8.5	9.2	12.9	13.7
159	Congenital malformations	6.5	6.2	5.9	5.4	4.9
160	Congenital debility	8.0	8.4	10.2	12.0	13.4
161a	Premature birth	18.7	19.2	19.1	17.8	16.5
161b	Injury at birth	3.4	3.4	3.3	3.6	2.7
162	Other diseases peculiar to early infancy	2.5	2.9	3.8	4.2	3.3
	All other specified causes	8.5	9.2	9.6	7.9	10.0
205	Cause of death not stated*	2.5	3.1	3.4	4.3	4.9
	All causes	78.7	78.5	88.1	86.8	88.1

* Includes "Ill-defined causes."

measles did not reach a rate of 1 per 1,000 births in any of the 5 years reviewed.

The increases which took place between 1924 and 1925 in infant death rates from diarrhea and enteritis, bronchitis and pneumonia, influenza, and to a smaller extent from congenital malformations, were for the most part balanced by decreases in mortality from premature birth, congenital debility and "Other diseases peculiar to early infancy," No. 162. There was also a decrease in mortality from a number of minor causes and from unstated or ill-defined causes.

On account of the limited period under review and the variations in rates from year to year for certain causes of death, no very definite opinion can be hazarded as to the probable permanence of the decrease noted for the years 1924 and 1925, but in a tentative manner the view may be advanced that since the rate for 1924 was maintained under less favorable conditions in 1925, there is every ground to hope that it will remain, unless under very exceptional conditions, below the level of the earlier years of the period, and it is hardly likely to rise to any significant extent above 80 per 1,000 living births.

Taking the 5 years from 1921 to 1925 as a whole, the death rate of male infants was 126 per cent of the death rate of females. Considered year by year the male rate ranged from 122 to 128 per cent of the female rate. "Injury at birth" averaged over the 5 years 150 per cent of the female rate, convulsions 145 per cent, influenza 133 per cent and congenital debility 130 per cent. Bronchitis and pneumonia, diseases of the stomach, and diarrhea and enteritis showed a per cent proportion not far removed from the average for all causes. In premature birth the percentage was 122, in congenital malformations 121 and in "other diseases peculiar to early infancy," 123 per cent. Measles affected the sexes equally while in whooping cough the male infants had the advantage, their death rate being only 92 per cent of the female rate. It is however necessary to state that the per cent proportion of male to female rates was not level for all years of the period. For example, the male rate for diarrhea and enteritis was 141 per cent of the female rate in 1923, 128 per cent in 1924 and only 116 per cent in 1925. Premature birth showed a percentage of 128 in 1923, of 115 in 1924 and of 120 in 1925. For injury at birth the male rate was 132 per cent of the female in 1923, 146 per cent in 1924 and 179 per cent in 1925.

A comparison of infant mortality rates in urban and rural areas is of especial interest as showing in what class of community the decrease in the rate, over the 4 years 1921 to 1924 took place. The figures for 1925 covering this phase of infant mortality not being complete for the Registration Area as a whole (the furnishing by the bureau to six provinces their vital statistics compilations delayed these results for Canada), the survey is restricted to the 4 years for which complete data is available. The analysis is made for 4 classes of communities for the

TABLE V

PER CENT PROPORTION OF INFANT MORTALITY RATES OF MALES TO FEMALES IN THE REGISTRATION AREA OF CANADA, 1921–25

Int. List No.	Causes of Death	1921–1925	1925	1924	1923	1922	1921
7	Measles	100	100	80	114	100	100
9	Whooping cough	92	92	92	94	100	85
11	Influenza	133	123	155	131	135	157
80	Convulsions	145	135	161	127	135	152
99, 100, 101	Bronchitis and pneumonia	125	124	133	121	125	127
112	Diseases of the stomach	125	130	110	108	133	200
113	Diarrhea and enteritis	127	116	128	141	124	131
159	Congenital malformations	121	122	124	107	125	123
160	Congenital debility	130	124	118	133	134	132
161a	Premature birth	122	120	115	128	125	121
161b	Injury at birth	150	179	146	132	145	162
162	Other diseases peculiar to early infancy	123	133	119	117	131	106
205	Cause of death not stated*	128	145	110	143	133	126
	All causes	126	124	122	127	128	127

* Includes ill-defined.

actual registrations of births and deaths which occurred in these communities. The classes are:

A. Cities of 40,000 and over
B. Cities of from 10,000 to 40,000
C. Cities and towns of from 1,000 to 10,000
D. Rural parts (including towns and villages of less than 1,000 population)

Taking a total for the 4 years the best average was shown for rural parts, 83.6 per 1,000 births, followed by cities of 40,000 population and over with a rate of 85.4 and cities of 10,000 to 40,000 with a rate of 87.9. The highest average rate for the 4-year period, 91.5 per 1,000 living births, was in towns of 1,000 to 10,000. From 1921 to 1924 rural parts showed a decrease of 5.5 per cent, towns of 1,000 to 10,000 a decrease of 5.2 per cent, cities of from 10,000 to 40,000, 17.7 per cent, and cities of 40,000 population and over a net reduction of 18.6 per cent. The rate in cities of from 10,000 to 40,000, which in 1921 was higher than that of rural parts by over 11 deaths per 1,000 births, was slightly lower in 1924. The rates for cities of 40,000 and over, which was nearly 9 deaths per 1,000 higher than that of rural parts in 1921, was about 4 deaths lower in 1924. In the last year of the period the rate for towns of from 1,000 to 10,000 was much higher than that of any other class.

TABLE VI

INFANT MORTALITY RATES FOR RURAL PARTS OF THE REGISTRATION AREA OF CANADA AND FOR URBAN COMMUNITIES CLASSIFIED BY SIZE, 1921–1924

Death rates per 1,000 births	Cities of 40,000 Population and Over	Cities of 10,000–40,000 Population	Cities and Towns of 1,000–10,000 Population	Rural Parts*
1924	74.9	77.9	89.7	78.7
1923	86.4	89.7	90.7	87.7
1922	88.3	89.3	90.9	84.5
1921	92.0	94.6	94.6	83.3
Average for four years	85.4	87.9	91.5	83.6
Per cent decrease, 1921 to 1924	18.6	17.7	5.2	5.5

* Including towns under 1,000 population and all villages

For an analysis of the incidence of infant mortality at the various periods of the first year of life, the year has been divided into quarters, the first quarter into months and the first month into weeks in order to ascertain the deaths occurring in the first week separately from the remainder of the initial month of life. Taking the gross births and infant deaths of the 5 years, 1921 to 1925 in the Registration Area, the infant mortality rate was 84.2 per 1,000 living births. To this rate the first week of life contributed 30.1 deaths per 1,000 births, or more than 35 per cent of the total; the first month 42.8 deaths or more than 50 per cent of the total, and the first quarter 56.0 deaths or more than 66 per cent of the total. It may be noted that the first 24 hours account for about half of the mortality of the first week of life. The difference between mortality in the second and third month of life was not great; 7.2 per 1,000 in the second month as against 6.0 per 1,000 in the third. The three last quarters of the year show a tapering down of the rate; 13.1 per 1,000 in the second quarter, 8.8 in the third and 6.3 in the fourth.

The average number of lives at risk is, of course, less in the last quarter than in the other periods but this factor is small in comparison with the differences noted.

When the rates for individual years are compared, the mortality of the first week shows no definite trend, though the rates for 1924 and 1925 are slightly lower than that of any of the 3 preceding years. In every other period of the first 12 months of life, the 2 last years show a very definite decrease in the rate.

In order to determine what causes of death are most prominent in each period of the first year, rates for each period have been calculated for certain causes from the gross births and deaths of the 5 years 1921 to 1925. Of a total rate of 21.5 per 1,000 living births in the first year of life, prematurity and injury at birth show a rate of 17.2 per 1,000 for the first week, and 20.4 for the first month. Deaths from congenital malformations and "other diseases peculiar to early infancy" (No. 162) are somewhat less concentrated in the first week and month, while the rates for congenital debility are extended more throughout the year than any other cause peculiar to early infancy. Of a total annual rate of 10.5 per 1,000 births for congenital debility, the first week accounts for 3.9, the first month for 6.1. Bronchitis and pneumonia, and diseases of the stomach, show a higher rate for the earlier quarters than for the succeeding ones. Diarrhea and enteritis show little difference between the first and second quarters or the first three months of life considered singly. For bronchitis and pneumonia and for diseases of the stomach the rate for the first month is heavier than for the second or third. If we select influenza, measles and whooping cough from communicable diseases, we find that the risk from influenza is heaviest in the first month and quarter, tapering slowly down in succeeding periods. Whooping cough reaches its peak in the second month. Mortality due to measles is more irregularly distributed, and has by a small margin the heaviest rate in the last quarter of the infant year. Infantile convulsions are most fatal in the first week of life, though better diagnosis at later ages may affect the comparison. More than one-quarter of all deaths credited to infantile convulsions occurred in the first week of life.

TABLE VII

MORTALITY RATES FROM CERTAIN SPECIFIED CAUSES BY AGE PERIODS OF THE FIRST YEAR OF LIFE: FIVE YEARS, 1921–25

Int. List No.	Causes of Death	Total Under 1 Yr.	Under 1 Week	1 Week and Under 1 Mo.	Total Under 1 Mo.	1 Mo. and Under 2 Mos.	2 Mos. and Under 3 Mos.	Total Under 3 Mos.	3 Mos. and Under 6 Mos.	6 Mos. and Under 9 Mos.	9 Mos. and Under 12 Mos.
7	Measles	.57	*	.05	.05	.03	.03	.11	.09	.17	.19
9	Whoop'g cough	2.36	.01	.17	.18	.34	.31	.83	.64	.49	.41
11	Influenza	2.15	.05	.29	.34	.29	.25	.88	.51	.42	.34
80	Convulsions	2.71	.77	.48	1.25	.26	.22	1.73	.48	.29	.20
99, 100, 101	Bronchitis and pneumonia	10.74	.46	1.31	1.77	1.23	1.11	4.11	2.76	2.14	1.73
112	Diseases of the stomach	.87	.05	.16	.21	.14	.13	.48	.22	.10	.06
113	Diarrhea and enteritis	10.94	.18	1.05	1.23	1.16	1.24	3.63	3.59	2.33	1.39
159	Congenital malformations	5.76	2.85	1.25	4.10	.51	.32	4.93	.45	.25	.13
160	Congenital debility	10.46	3.90	2.19	6.09	1.23	1.02	8.34	1.45	.46	.21
161a, 161b	Premature birth; Injury at birth	21.52	17.16	3.25	20.41	.61	.24	21.26	.20	.05	.01
162	Other diseases peculiar to early infancy	3.35	2.50	66	3.16	.12	.04	3.32	.02	*	—
205	Cause of death not stated or ill-defined	3.67	1.29	.57	1.86	.38	.30	2.54	.59	.34	.20
	All causes	84.17	30.11	12.70	42.81	7.20	5.98	55.99	13.08	8.80	6.31

* Less than .01 per thousand living births.

TABLE VIII

MORTALITY UNDER ONE YEAR OF AGE OF CHILDREN BORN IN THE REGISTRATION AREA, IN THE CALENDAR YEAR 1924

Month of Death 1924	Month of Birth in 1924												
	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
January	481	481	...	...	...	...	...	...	...	...	...	...	...
February	641	148	493	...	...	...	...	...	...	...	...	...	...
March	817	87	179	551	...	...	...	...	...	...	...	...	...
April	835	60	78	204	493	...	...	...	...	...	...	...	...
May	845	60	46	90	170	479	...	...	...	...	...	...	...
June	800	29	39	56	65	151	460	...	...	...	...	...	...
July	767	21	22	38	45	71	103	467	...	...	...	...	...
August	897	41	49	53	54	77	81	141	401	...	...	...	...
September	989	34	45	73	76	80	71	102	138	370	...	...	...
October	913	23	30	27	32	46	78	78	83	134	382	...	...
November	828	17	21	18	29	37	43	44	53	59	137	370	...
December	984	22	20	24	20	28	31	33	60	66	85	153	442
1925													
January	576	10	25	27	26	27	34	33	43	46	77	73	155
February	419	...	7	26	20	29	30	38	42	39	56	53	79
March	469	...	...	12	28	43	54	38	57	39	50	69	79
April	306	...	...	...	14	20	31	31	37	38	38	46	51
May	217	...	...	...	...	8	25	44	26	21	22	34	37
June	121	...	...	...	...	...	8	14	16	17	30	18	18
July	75	...	...	...	...	...	...	9	8	15	8	13	22
August	129	...	...	...	...	...	...	...	5	35	23	28	38
September	141	...	...	...	...	...	...	...	...	18	46	32	45
October	61	...	...	...	...	...	...	...	...	...	9	21	31
November	17	...	...	...	...	...	...	...	...	...	...	4	13
December	4	...	...	...	...	...	...	...	...	...	...	...	4
Total deaths under one year	12,332	1,033	1,054	1,199	1,072	1,096	1,049	1,072	969	897	963	914	1,014
Total living births	157,595	12,854	12,749	14,365	13,742	13,848	13,344	13,243	13,202	12,999	12,768	12,078	12,403
Infant mortality rate per 1,000 children born alive, 1924	78.3	80.4	82.7	83.5	78.0	79.1	78.6	80.9	73.4	69.0	75.4	75.7	81.8
Infant mortality rate per 1,000 children born alive, 1923*	83.5	98.6	97.6	94.9	87.2	84.7	79.5	80.5	71.8	73.2	75.3	76.1	81.4
Average rate, 1923 and 1924	80.9	89.5	90.2	89.2	82.6	81.9	79.1	80.7	72.6	71.1	75.4	75.9	81.6

* Obtained from table similar to above for births of 1923.

One important aspect of infant mortality is the effect which seasonal influences may have. This phase of the subject can be dealt with here only in the most cursory manner. During the first 3 years under the present system only total figures for infant mortality were given by calendar months; for 1924 and 1925, however, this tabulation has been made for each of the more important causes. The following brief discussion therefore relates to the gross figures of the last 2 years. Infant deaths from bronchitis and pneumonia are heaviest in the first quarter of the year and lightest in the third quarter; for diarrhea and enteritis the opposite is true. Deaths from bronchitis and pneumonia by quarters were 1,158, 894, 338 and 645; the corresponding deaths from diarrhea and enteritis were 352, 354, 1,531 and 660. Influenza and measles claimed the majority of their victims in the first half of the year and more in the first than in the second quarter. Beyond a peak in the month of August, whooping cough showed no particular indication of seasonal incidence in 1924. It was most fatal from August to October in 1925.

For all other causes the deaths by quarters were 4,639, 4,544, 3,841 and 4,053 respectively. For all causes the figures by quarters were 6,662, 6,242, 5,991 and 5,635. In proportion to the number of births in each quarter the death rates for all causes were 84.5, 76.6, 76.1 and 77.2 per 1,000. Owing to variations in the number of births in each quarter this method of calculation somewhat favors the first and second quarters at the expense of the third and especially of the fourth.

A tabulation by month of death and by month of birth throws some light on certain phases of infant mortality and incidentally gives a clue to the accuracy

of the annual and monthly infant mortality rates as ordinarily calculated. On the average during the 3 years, 1923, 1924 and 1925, 78.2 per cent of infant deaths of each year were from births of the same calendar year. Also on the average 42.3 per cent of the infant deaths of each month were from births of the same calendar month. The difference between these figures indicates why the monthly mortality rate is less satisfactory than the annual when both are based on the proportion of deaths to births for the same period. The objection is not so serious when the rate for a certain month is compared over a series of years, but has more force as regards the comparison of rates for different months of the same year, minimizing the mortality of heavy birth months and exaggerating that of the light birth months. The tabulation of the month of death by month of birth allows an adjustment of the monthly death rate on a more accurate basis.

By combining this tabulation for 2 years, the children who were born in a certain calendar year or calendar month can be followed through the first year of their life. The mortality rate thus obtained for the births of 1923 was 83.5 and for the births of 1924, 78.3. There was a considerable variation in the mortality rates of children born in different months. Averaging the results for the 2 years, the highest rates of mortality were for births of the first quarter, each month of which gave a rate in the neighborhood of 90 deaths per 1,000 living births. On the other hand, all months from August to November averaged under 76 and the rate for births of September was only 71 per 1,000. These differences are suggestive although the results would be more satisfactory if taken on a wider base and if information were available to show the extent of any compensating influences in the second year of life.

SUMMARY

Causes for the decrease in infant mortality in the Registration Area of Canada during the period 1921 to 1925 are to be found in the general movement for the protection of the health of the child and of the mother. Public opinion is becoming educated to the wilful waste and needless suffering of which ignorance is the chief cause. During the last 5 years there has been a great advance in public interest in child welfare and complementary to it in the prenatal care of the expectant mother. A great number of agencies have had a part in producing this result, among which are the Child Welfare Division of the Federal Department of Health, the Canadian Council of Child Welfare, and the prenatal and baby clinics maintained by the different provinces. Particular reference is permissible to a feature of this work in Saskatchewan where, if the financial condition of the expectant mother is such that she is not able to obtain the services of a doctor, she is assisted to the extent of $25. In 1920, 18 mothers were helped to the extent of $441, in 1925 the grants amounted to $12,874.50, giving aid to 531 mothers.

It is also worth while mentioning that Quebec, which entered the Registration Area as of January 1, 1926, maintains altogether about 70 baby clinics where physicians and nurses give instructions.

A great deal has been done in recent years in Canada to give the baby a chance to live and incidentally the mother, but much remains to be done and it is hoped that when we can make a 10-year survey of the vital statistics of Canada it will be found that owing to the efforts of the workers in child welfare, we shall have the satisfaction of recording a greatly decreased infant death rate, and reduction to a minimum of what someone has aptly termed the anomaly of so-called modern civilization—maternal deaths.

THE PSYCHOLOGY OF PUBLIC HEALTH EDUCATION *

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SOME YEARS ago an enterprising French official was made responsible for effecting sanitary reform in Syria. He began by sending out questionnaires to the leading local authorities. He expected the answers to contain sufficient information to enable him to formulate his policy and program. From Damascus there came these replies:

Question—What is your birth rate?

Answer—I do not know, and I hesitate to inquire.

Question—What is your death rate?

Answer—It is the will of Allah that all should die. Some die young, and some die old.

Question—What is your water supply?

Answer—From time immemorial no one in Damascus has been known to die of thirst.

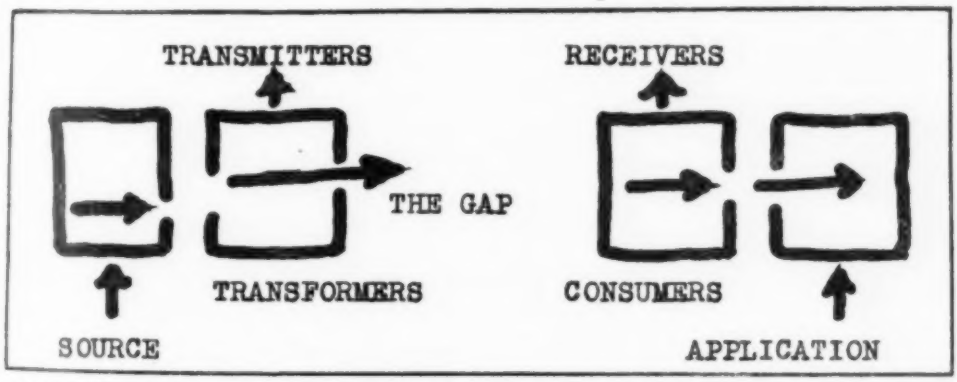
Question—What comments have you to make regarding sanitary conditions in your city?

Answer—A man should not bother himself or his neighbor with questions that concern only God.

Who are the most difficult people among whom to work? Are they not these people of Damascus who live in your city? They are not necessarily the unwashed, the unshaved or the unbobbed. Many of them are leaders in their respective walks of life. But so far as helping you in your work is concerned, they are nevertheless from Damascus. If they ever think of your work, which probably happens only when you intrude upon them, their minds hold such questions as these: "Now what's this? Why do these health people do so many things we don't understand?"

The gap between scientific health knowledge and common health practice is unfortunately wide. How shall we cross the stretches which separate us from the people of Damascus?

DIAGRAM I



On one side of this gap illustrated in Diagram I are the transmitters. On the other are the consumers. The transmit-

* Delivered at the Institute for Board Members of Public Health Nursing Organizations, under the auspices of the New Haven Visiting Nurse Association in affiliation with the National Organization for Public Health Nursing, New Haven, Conn., April 4–7, 1927.

ters are the health workers, aggressive, creative, active and dynamic. The consumers are the people, somewhat on the defensive, dormant, inert and static. It is for the transmitters to make the first moves.

ANALYZING OUR EFFORTS

But not so fast. Before we lay siege to Damascus, where do we start from? What are our own attitudes? "Conflict is civilizing when it involves an effort (1) to understand the opposing factor; and (2) to invent a means whereby the opposition is succeeded by fruitful coöperation."* This undertaking is a mind-binding process. Our own viewpoints comprise half. Inside adjustments must come before outside activities.

Do we respect the people of Damascus? Or is our starting point an attitude that we know so much and they so little? Is it that we condescend to give something to them—something by the way which we ourselves got from sources other than our own? Or do we have the attitude of a comrade who holds up a torch lit in the temples of science to illuminate the common path?

Intellectual pride may tempt us to claim closer kinship with scientific explorers than with other people. But comparing the known with the unknown, where are we? Have these explorers solved influenza and some of the other pressing health problems to any greater extent than the people have made actual use of discoveries already charted? We occupy a half-way position. Full knowledge is not yet ours to transmit.

A second mental attitude which commends itself is that of striving for creation. We are not called upon to invent new devices in the realms of transportation, house-keeping or industry. But creation is not limited to machines. It may be applied to personality and to the health of individuals and social groups. Much creative thinking preceded our modern departments of health, visiting nurse associations, our prenatal, preschool, and school child health programs. Industrial hygiene, county health units, periodic health examinations, sickness insurance and state medicine—all call for more of the same kind of thinking. Realignments must be made with our constantly changing social currents. New discoveries in science and human experience in the use of these social instruments command us not to stand still. We must be restless and of questioning mind to achieve the best which lies beyond our present better than the past.

A third mental attitude almost suggests itself. Enthusiasm is more communicable than any disease. Did you ever meet a real pioneer who was not enthusiastic? Our outlook should be that of a pioneer. Our conquests in the realm of health have only begun. We may not be a Jenner, yet we may share his pioneering spirit as we call upon the people to possess themselves of his discovery and thus enrich themselves for life. Dr. George E. Vincent, President of the Rockefeller Foundation, exemplifies this pioneering spirit when he writes or talks about the world conquest of yellow fever or about any other health subject. Enthusiastic transmission increases interest in the health game and results in bigger social gate receipts.

MAKE APPEAL SIMPLE, IMMEDIATE

Why is it necessary to employ psychological methods in public health education? Because individuals comprising the public are so handicapped. It would be so much easier for us to enlist these individuals if each one of them possessed a dozen eyes, six ears and two heads. The number of hours in his day might also be doubled. Now after working eight hours or more a day and sleeping eight hours or less at night he has left a very limited amount of free time. For this fraction of time there is the keenest competition. Run over the list: news-

* From Lectures-in-Print, *Influencing Human Behavior* by Professor H. A. Overstreet, published by W. W. Norton & Co., New York.

papers, magazines, books, posters, placards, billboards, illuminations, window demonstrations, jazz, music, clubs, committees, church, salesmen, mail. From every side something launches itself against him from the time he gets up in the morning till he goes to bed the next morning. He may start the day with setting up exercises but he lies down at night too exhausted to turn off the radio. He probably does not appreciate our solicitude for his welfare, nevertheless, this harassed citizen may be doomed to go through to the end of his days without our beneficent influence, unless we employ psychological methods to penetrate into the central fields of his consciousness. Competition requires this of us. Let others show mercy.

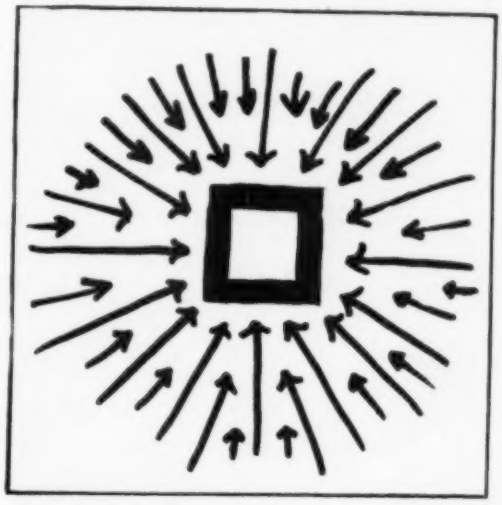
"He who can capture and hold my attention has me half won." It is the first impact which determines what the mind will do next. Psychologists call it arresting attention and maintaining interest. The opening paragraph of Hendrik van Loon's book, *The Story of Mankind*, illustrates how it may be done:

> High up in the North in the land called Svithjod, there stands a rock. It is a hundred miles high and a hundred miles wide. Once every thousand years a little bird comes to this rock to sharpen its beak. When the rock has thus been worn away, then a single day of eternity will have gone by.

This author's first 58 words committed me to undertake reading his book of 483 pages, providing, of course, that he sustained my interest. He already had my attention. He retained my interest as against all other books by his further treatment—8 colored pictures, 8 half-tone pictures, 142 pictures and animated maps accompanied by original descriptions. I followed him through enthusiastically because he was a pioneer transmitter. It is not surprising that his book went through twenty printings.

So many of our public health education efforts lack the stimulating qualities. We miss the provocative attention-arresting interest-sustaining fire. "This is the way to heaven but you can go to hell if you want to. I have done my duty by you. Let us close with the benediction." That flat spirit has nothing gripping in it. Is it that we are not encompassed by our task? Have we become so accustomed to our material that the luster has worn off? Have our ideas been passed over the footlights so often that they have become stale?

DIAGRAM II



I saw "Abie's Irish Rose" soon after it was staged (I am well along in years). Recently, I saw it again with several of the original cast who were saying their lines for nearly the six thousandth time. Few health educators have been called upon to say their lines 6,000 times. Here is a remedy when you find your own attention and interest are flagging. Whip yourself into shape by mingling with the crowd outside or by watching people's faces through a slit in the stage curtain.

HUMAN APPEAL

Appeal to some want. Reasoning alone is insufficient. Enlistments for the fight for better health will not come through argument. I had to discover this for myself in China. At first, my approach was wrong. I tried lecturing and writing on *China and Public Health*. My output lacked tang. Those were the days when the Chinese were beginning to manifest a

national spirit. They were asking each other, "What Makes Nations Strong?" They felt themselves weak and wanted to become strong. That was my cue. From that discovery on my lectures were on the subject, *Some Relations Between National Health and National Strength.* From then on things went along much better.

Cholera and Health fought daily on the streets of Foochow, China, in a health parade. Cholera pointed out the dangers. Health suggested the remedies.

These figures were built on bamboo frames. Cholera was about eight feet high. The man inside had a window in the frame in order to see. Head and arms were operated by levers. Both figures were accompanied by students with megaphones so the back fringes of the crowd might get the message.

The same approach was used in advocating specific needs, such as vital statistics. Now very little information is available regarding general birth and death rates or specific morbidity and mortality rates. Reporting of births and deaths is not required. Of all the possible arguments available, none was more effective than relating the need for a system of vital statistics to their desire for national strength. This was done by pointing out that every strong nation had such a system and also had a low death rate. This same psychological approach may be employed with smaller groups and with individuals. "Most people would rather be sick millionaires than healthy peddlers." They must be shown that a sick peddler will never become a millionaire. Health is not an end in itself, but a means to some end. The specific health measures advocated should be related to bringing greater security, happiness, comfort, wealth or position than is now possessed. To the potential user, these measures constitute the unknown. But he is aware of what he wants. Tie them together.

It is poor psychology to stress the horrors of disease. Lay emphasis on the positive side of health. Automobiles become muddy and acquire flat tires. But the automobile sellers advertise only by beautiful pictures of freshly painted cars just out of the factory. Silk stockings develop holes, collars become soiled, real estate properties have bank mortgages on them, clothing becomes baggy—but are these the things which are emphasized by those who urge us to buy? Then why try to sell health by picturing disease?

Recently two organizations in China undertook smallpox vaccination campaigns. Both developed large posters. One depicted all the horrors of the disease—pock marks, blindness, poverty and graveyard bones. The other merely showed a smiling child pointing with pride at a vaccination scar. The latter poster was more in demand.

VISUALIZATION SCORES

The health educator should Say It With Pictures. Eighty-five per cent of our knowledge is said to come to us through the eye. Health is a subject which lends itself to thinking in pictures. Within this category fall words, charts, graphs, maps, models and plays. The demonstrations by big foundations in

hookworm, child health and county health units are large pictures on a big social canvas.

Is it diphtheria you wish to eliminate from your community? Make a picture of your city closing and locking a door already partly shut. Are you emphasizing some unnecessary load of sickness now being carried? Have a man on the platform carrying a bag on his back. Make him do some work and demonstrate how the load interferes with his efficiency. Then open the bag and take out a block of wood labeled with the appropriate name. Even the best product in the world will not reach its highest possible sales without being truthfully visualized. One reason why the heaven product until recently on the spiritual market has been so hard to sell is because no salesman was able to produce authentic pictures.

The people of Damascus are all around us. They may not be waiting for us. Their faces may be turned in other directions. They do not determine entirely whether to listen to us or to some other claimant. We decide that before our arrival.

A FOUNDATION IN NURSING EDUCATION AT THE UNIVERSITY OF CALIFORNIA

An important development in nursing education was consummated when the California Legislature of 1925 passed a bill which created a foundation in Nursing Education in the University of California.

The impetus for this action was given by the nurses of California in meeting the desire of the State Board of Control for the disposal of a surplus fund accumulated from registration fees received by the Bureau of Registration of Nurses. This fund had accumulated during a period of two years since it had been "frozen" by a decision of the Supreme Court in 1923. The directors of the California nursing organizations decided that this surplus amount should be used to establish a chair of nursing education in the University of California at Berkeley.

This chair of Nursing Education will be placed within the Department of Hygiene. While this department is responsible for the administration of the chair, other departments will contribute in no small measure to the needs of this young foundation.

There will be courses in teaching and administration in schools of nursing, accompanied by correlated courses in history of education, psychology, principles of teaching, and preventive medicine.

A Committee on Nursing Education has been appointed by the President of the University to act in an advisory capacity. This committee will outline the general policies and curriculum.

By the establishment of this foundation at the University of California, a great need in nursing education will be met. In this vast western country, there has been no endowment offered to provide facilities for the preparation of teachers and administrators in schools of nursing. Although large gifts to nursing education are not unknown, they are rare. We may cite the gift of Florence Nightingale to St. Thomas' School of Nursing, London, England; the gift of Mrs. Helen Hartley Jenkins to the Department of Nursing and Health, Teachers College, Columbia University, New York; the gift of Mrs. Chester C. Bolton to Western Reserve School of Nursing, Cleveland, and the grant of the Rockefeller Foundation to the School of Nursing at Yale University, New Haven. The endowment for this chair, comparatively small in amount, is unique in that it represents the spirit of nurses in California and has been accumulated wholly from money paid by nurses as fees for registration; it will be devoted to a great purpose, which in its development, it is hoped, will demonstrate the worthiness of a larger endowment.

INSTITUTE FOR BOARD MEMBERS OF PUBLIC HEALTH NURSING ORGANIZATIONS

NEW HAVEN, CONNECTICUT, APRIL 4–7, 1927

AT the suggestion of the New Haven Board of the Public Health Nursing Association about 200 board members representing public health nursing organizations of Northeastern States met in New Haven, Conn., April 4–7. The purpose of this institute of lay health workers was two-fold: To discuss the general policies of their organizations in their relation to the health activities of other public and private agencies in their communities and to stimulate further study of these relations and the health needs of their towns and cities. Representatives of about 100 nursing associations came from as far as Montreal, Indiana, Michigan and Virginia—some representing associations having but 1 nurse, others with a staff of 100 nurses.

The subjects of the institute were selected to satisfy the four types of associations—rural, town, small city, and large city. Round table discussions followed the formal programs.

In her address on the "Relation Between the Board and Its Professional Staff," Miss Katherine Tucker, R.N., Director, Philadelphia Visiting Nurse Society, emphasized 3 essentials: "A partnership of equality requiring mutual understanding; the board determining public relation policy; the staff responsible for the nursing."

"Public Health Nursing in Its Relation to the Medical Profession" was discussed from the point of view of "The Physician" by Haven Emerson, M.D.; "The Nurse" by Janet Geister, R.N., of the American Nurses Association; "The Board Member," by Florence E. Hegeman, Visiting Nurse Association, Brooklyn, N. Y.

Dr. Emerson clearly defined the difference between the public health nurse on a salary who is never conducting her work for profit and the physician, who must do it. He also pointed out that the responsibility for diagnosis and treatment is legally given by the state to the physician, while the nurse can act only as his agent, as a coworker. He urged that each public health nursing association have a medical advisory board delegated by the county or city medical society.

"The Board should meet to get the job done, therefore a small working board is preferable"—was the gist of the speech given on the "Function of the Board" by May Gardner, R.N., of the Providence, Rhode Island, District Nursing Association.

Professor C.-E. A. Winslow in his discussion of the relationship between the board and the community cautioned each board that in working out its ideal plan that the scope and extent of its program were fundamental; for example, to aim for 1 nurse for every 2,000 population in the city and 1 nurse to 1,500 population in rural communities. He also stressed the importance of solving the problem of the high cost of nursing to the satisfaction of the patient and the nurse.

How public support for public health nursing can be mobilized through the media of publicity, annual reports, and fund raising campaigns was treated in a practical manner by W. W. Peter, M.D., formerly of Shanghai, China; Professor Ira V. Hiscock of Yale University; and Hazel Corbin, R.N., of the Maternity Center Association of New York City.

The financial problems that beset board members was another topic approached from several angles—the relationship with community chests, national health agencies and private contributions. Allen T. Burns, executive director, American Association for Community Organization, spoke specifically on the financing of public health nursing.

Another session was devoted to the education of board members, and in his address Dr. George E. Vincent, President of the Rockefeller Foundation, summed up the opportunities and responsibility of the board members.

At the closing meeting E. H. Lindeman, New York School of Social Work, New York City, definitely outlined to the delegates the responsibilities of leadership.

This meeting of local community leaders marks an epoch in the decentralization of public health administration. It may well be the point of change from the sewing circle social event to the informed deliberate discussions of studious and earnest responsible representatives. At least it has shown the method and created much inspiration to tip the scales from the mystified passive sitting on the board to the side of intelligent deliberation and informed action.

The June issue of the *Public Health Nurse* will publish the papers read at the institute.

A. B. EMMONS, 2D, M.D.

TUBERCLE BACILLI IN THE RAW MILK OF THE CHICAGO DAIRY DISTRICT

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THE PREVENTION of bovine tuberculosis in man is based fundamentally upon the eradication of the disease in the dairy cow. In the past thirty years numerous investigations have repeatedly disclosed the presence of living tubercle bacilli in market milk.

A complete review of the literature summarized in the following table shows a wide variation in the number of positive findings by different observers.

The collected data from all sources comprise a total of 16,700 specimens of market milk, of which 1,448, or 8.66 per

TABLE I

CHRONOLOGICAL TABLE SHOWING INCIDENCE OF TUBERCLE BACILLI IN MARKET MILK REPORTED FROM 1893 TO 1925 INCLUSIVE

Observer	Date	Place	Kind of Sample	No. of Samples	No. Positive	Per cent Positive
St. Friis [1]	1893	Copenhagen	Raw	28	4	14.3
Schroeder [2]	1893	Washington	Raw	19	1	5.3
Obermueller [3]	1894	Berlin	Raw	13	8	61
Ernst [4]	1895	Boston	Raw	13	3	23.1
Zacharbekoff [5]	1895	St. Petersburg	Raw	22	2	9.1
Buegge [6]	1896	Halle	Raw	6	2	33.3
Rabinowitsch [7]	1897	Berlin	Raw	25	7	28
Delepine [8 9 *]	1896 to 1898	Liverpool	Raw	224	28	12.5
Boyce, Hamilton, Woodhead, Delepine [10 11 *]	1897 to 1899	Liverpool	Raw	545	49	9
Massone [12]	1896	Genoa	Raw	33	3	9
Ott [13]	1897	Schwabisch Gmund	Raw	28	3	10.7
Petri [14]	1898	Berlin	Raw	64	9	14
Jaeger [15]	1899	Konigsberg	Raw	6	2	33.3
Kanthack [16] and Sladen	1899	Cambridge	Raw	16	9	56.3
Ascher [17]	1899	Konigsberg	Raw	17	1	5.9
MacFadyean [18]	1899	London	Raw	77	17	22
Pawlowsky [19]	1900	Kiev	Raw	51	1	2
E. Klein [20]	1900	London	Raw	100	7	7
Max Beck [21]	1900	Berlin	Raw	56	17	30
Santori [22]	1900	Rome	Raw	90	4	4.4
Hope [23]	1896 to 1903	Liverpool	Raw	2885	128	4.4
Klein [24]	1904 to 1906	London	Raw	64	5	7.8
Collingridge [25]	1905	London	Raw	22	2	9
A. Eber [26]	1905 to 1906	Leipzig	Raw	210	22	10.5
Proskauer,[27] Croner, Seligman	1905	Berlin	Raw	22	10	45.4
E. Prussian Dutch Held Brook Society[28]	1906 and years previous	Konigsberg	Raw	1596	97	6.1
Anderson [29]	1908	Washington	Raw	232	16	6.9
Mohler [30]	1908	Washington	Raw	73	2	2.7
Schroeder [31]	1908	Washington	Raw	36	2	5.5
Stokes [32]	1907 to 1909	Baltimore	Raw	88	4	4.5
Hess [33]	1909	New York	Raw	107	17	15.9
			Past.	8	1	12.5
Campbell [34]	1909	Philadelphia	Raw	123	18	14.6
			Past.	12	1	8.3
Golet [35]	1909	Rochester, N. Y.	Raw	80	5	6.3
Tonney [36]	1910	Chicago	Raw	95	10	10.5
Eber [37]	1908 to 1910	Lautenthal in Harz	Raw	158	4	2.53
Thöni [38]	1912 to 1913	Berne	Raw	212	17	8
Mitchell [39]	1913 to 1914	Edinburgh	Raw	406	82	20
Miller [40]	1913	Edinburgh	Raw	101	13	12.9
Delepine [41 42 43 44 *]	1897 to 1917	Manchester	Raw	8040	736	9.15
Bartlett [45]	1923	New Haven	Raw	41	18	44
Wilson [46] and Nutt	1925	Manchester	Raw	398	52	13
Tonney, White, Danforth	1923 to 1925	Chicago	Raw	258	9	3.5
Total				16,700	1448	8.66

* Summary.

cent, were positive. This table includes reports of tests made by animal inoculation only.

Examination of the raw market milk of Chicago in 1910 yielded living tubercle bacilli in 10.5 per cent of the samples tested. The situation at that time demanded immediate action for the protection of the public health, and since the effective methods of eliminating tuberculosis from dairy herds were known to be time consuming, pasteurization of the milk was adopted in 1911 as an immediate means of protection in Chicago.

The apparent security which pasteurization afforded seems to have been responsible for a tendency in certain sections of the Chicago dairy district to depend wholly upon it for protection and to neglect the measures offered by federal and state governments to eradicate tuberculosis from dairy cattle. This dangerous and uneconomical practice has been further encouraged in Illinois by the Shurtleff Act passed in 1911, which prohibits the enforcement of the tuberculin test of cattle by cities to safeguard their milk supply.

Faced with this situation and realizing the shortcomings of commercial pasteurization of milk as a sole means of protection against bovine tuberculosis, Dr. Herman N. Bundesen, health commissioner, ordered a survey of the raw milk intended for the Chicago market, to determine the incidence of tubercle bacilli in this product.

SURVEY OF CHICAGO'S RAW MILK

During the years 1923, 1924, and 1925, the research division of the bureau of laboratories, in conjunction with the food bureau, made this survey. A total of 329 samples of raw milk was collected. Care was taken to make the survey representative of the entire Chicago dairy district by adjusting the number of samples of milk to the proportionate output of each locality.

The samples were taken in one-pint sterile containers. Portions of the samples, after thorough mixing, were centrifuged at high speed and 1 c.c. of a mixture of the cream and sediment thus obtained was inoculated subcutaneously into half grown guinea pigs. These tests were made for the most part in triplicate to reduce the loss of specimens by early death of the animals. The test animals were held under observation from 6 to 8 weeks, when they were injected with 1 c.c. of old tuberculin and autopsies made upon those that died. The surviving pigs, from samples giving no evidence of tuberculosis at the first examination, were held for 3 months before being finally reported as negative. Samples whose test animals died early, viz., within 30 days—and there were 71 in number—were eliminated from the series. In the 258 tests in which the pigs survived for more than 30 days, 9, or 3.5 per cent, were found to be positive. Acidfast bacilli found in typical caseous lesions, which failed to grow within 7 days upon glycerine agar, were regarded as acceptable evidence of tuberculosis. Rabbits were inoculated subcutaneously with macerated tissue from each of the guinea pigs showing tuberculous lesions. The death of these rabbits from generalized tuberculosis tended to show that the tubercle bacilli were all of the bovine type.

The daily milk supply of Chicago was approximately 1,350,000 quarts. The results of this series indicate that 3.5 per cent, or 43,750 quarts, per day of the raw milk prior to pasteurization was actively tuberculous in the period when the samples were taken (in the 3 years prior to January 1, 1926). This amounts to over 15,000,000 quarts per annum. Further analysis shows that 55 per cent of the positive samples was received from one county which, at the time, furnished Chicago with 20 per cent of the milk supply. The number of raw milk samples examined in this county was 73 and 5 of these, or 6.8 per cent, were found positive. At the time of sampling, approximately 250,000 quarts of milk per day were coming into the Chicago market from the county referred to, and applying the experi-

mental per cent of 6.8 to this amount, we arrive at an approximate estimate of 17,000 quarts per day, or more than 6,250,000 quarts per annum of milk containing tubercle bacilli from this one county alone. Recent tuberculin tests of 1,825 dairy cattle in this county showed, according to official records, that more than 78 per cent of the cattle tested were tuberculous.

The ever present danger inherent in milk originating from such a source, even if it is commercially pasteurized, is obvious. Commercial pasteurization is admittedly not as yet 100 per cent efficient and should not be relied upon to render such milk consistently safe for consumption. Recognition of this fact led to the recent passage of an ordinance in Chicago, requiring that all milk sold in this market be obtained from tuberculin tested cows.

SUMMARY

1. Of a series of 258 samples of raw milk destined for the Chicago market, 9, or 3.5 per cent, were found to contain living virulent tubercle bacilli of the bovine type.

2. Of 73 samples of similar raw milk collected in one county of the Chicago dairy district, 5, or 6.8 per cent, were found to be actively tuberculous.

3. An estimate based on these experimental data of the amount of tuberculous milk sent to pasteurizing plants for the Chicago market, indicates that in the 3 years prior to January 1, 1926, approximately 43,000 quarts per day, or over 15,000,000 quarts per annum, contained living tubercle bacilli.

4. A similar estimate applied to the largest producing dairy county of the district indicates that approximately 17,000 quarts per day, or more than 6,250,000 quarts per annum from this one county, were tuberculous in the same period.

5. Consideration of these and other facts led to the passage of an ordinance requiring that all milk sold in Chicago after April 1, 1926, be obtained from non-tuberculous cows.

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VACCINATION AND SMALLPOX

THE ANTI-VACCINATIONIST is always with us and never seems to tire of spreading his pernicious doctrines. It is perhaps a fault of the scientific mind to regard a case once proved as settled. It goes against the grain of the scientist to be constantly combating unfounded statements or to have his time taken up in spreading propaganda. However, it is necessary, and the sooner the health officer learns that he must continually hammer in facts on the public, the better it will be for public health.

In England the anti-vaccinationists are especially aggressive and since England pays more attention to conscientious objection than almost any other country, the result is that increasingly large numbers of people are escaping vaccination.

A recent number of the London *Lancet* [1] gives the facts of an investigation made in Berne by a committee appointed by the City Council which consisted of two medical men and three laymen, one of whom was an anti-vaccinationist and the other two opposed to compulsory measures. Forty thousand persons who had submitted to compulsory vaccination between the spring of 1922 and the autumn of 1924, when there was an outbreak of smallpox, were investigated. Fourteen cases of supposedly bad results were reported to the committee, but investigation proved that in only four was there any possible ground for the claim that vaccination was responsible for the subsequent condition. One youth of seventeen years developed encephalitis lethargica from which he recovered; a girl of nine who was vaccinated on the third or fourth day of the incubation period of measles died of septicemia which followed; a child of fourteen developed tonsilitis six days after vaccination which ended in fatal septicemia; a boy aged thirteen vaccinated six days after recovery from some intestinal trouble developed an acute fatal septicemia a week later.

One might very well question the causative connection between vaccination and these cases, but admitting, as the committee seemed to do, that the fault lay in vaccinating during the incubation period, or too closely after an acute infection, it is plain that they were not due to vaccination itself, and could have been prevented by a more careful selection of the time. At worst, in only one of every 10,000 vaccinated, was any ill effect attributed to the operation, while on the other hand, without vaccination many deaths would certainly have occurred.

The old bogey of spreading syphilis by vaccination seems again to have been revived. Physicians have long acknowledged the danger of spreading syphilis by arm to arm vaccination, so the method was abandoned many years ago. Bovine material is insisted upon at present. Numerous experiments, some of which have

been carried out by the writer, have definitely proved that syphilis cannot be transmitted to cattle, consequently there is no possible danger of transmitting the disease by bovine vaccine. All vaccines produced and sold in this country are protected by the Act of July 1, 1902. Laboratories wishing to produce such materials must be licensed by the Secretary of the Treasury on recommendation of the Public Health Service, and operated under regulations which provide for constant supervision, repeated examinations of the product and correct labeling.

In addition to the above mentioned precautions we have the actual test of the material on human beings. Since 1917, the Army and Navy combined have vaccinated 5,650,000 persons, not one of whom has developed syphilis as a result. The Public Health Service during the same period has vaccinated 2,918,748 persons without a single case of syphilis resulting. State and local authorities during the past ten years have vaccinated more than two million persons, many of whom were school children. We have then, a total of 10,568,748 persons who were vaccinated by governmental agencies and in no single case has there been even a report that syphilis had been caused by the operation.

The vaccine used by our government differs in no wise from that sold to, and used by, physicians in general. All of the vaccine produced or sold in this country is subject to the same regulations and supervision. The Surgeons General of our Army, Navy and Public Health Service[2] have recently joined in a statement showing the safety of vaccination. Their statement should be given as wide publicity as possible by health officers and physicians who are called upon to suppress or prevent smallpox.

1. *Lancet*, Dec. 11, 1926.
2. Feb. 15, 1927.

MENTAL HYGIENE AND IMMIGRATION

A BULLETIN issued by our Public Health Service on the subject which forms the title of this article deserves more than passing mention since it is one of the most important and best considered pieces of work put out by the Service for some time.[1]

For many years the United States was the dumping ground for European nations and only recently have we awakened to the necessity of restricting immigration, although it has always been a matter of public interest, the subject of much discussion and a great deal of legislation as well as the source of a vast amount of emotionalism and ill-considered oratory. In the early days our immigrants came almost entirely from the so-called Nordic races and were good representatives of their stocks. This gradually changed so that in 1914 only 18 per cent came from north and west Europe, while 75 per cent were from east and southeast Europe, and often those admitted were not good samples of the races from which they sprung.

The influx of numbers of new people into a country is almost sure to result in a great number of applications for aid. Increased financial burdens are placed upon the public and charitable organizations. In the past this has aroused interest chiefly from the economic point of view. The study under consideration has taken up the influence of these alien hordes on the mental stability of our population. Mental hygiene is one of the newest arrivals in the field of preventive medicine and its

importance is perhaps even now too little realized, largely because it has been considered a subject for the specialist and out of the scope of the ordinary medical man.

This study had its beginning in an analysis of 6,629 cases of mental disorder found among 17,957,807 aliens arriving as immigrants during a period of 22 years.

It is true that there have always been laws for the exclusion of people who for various reasons were considered unfit. All those "found to be idiots, imbeciles, feebleminded, epileptic, insane, with constitutional psychopathic inferiority, with chronic alcoholism, mentally defective, with tuberculosis in any form, with a loathsome contagious disease, or with a dangerous contagious disease, receive a class A certificate that enables the Immigration Service to determine easily to which group the alien belongs." Special boards may be appointed and appeals may be brought through a large number of agencies which sometimes involve racial groups, influential people and political organizations. Humanitarian considerations compel the landing of a sick person and a longer or shorter stay in the country. A number of mentally defective women and girls thus landed have married American citizens and have borne children. A case is cited of a mentally defective woman who was ordered deported in 1915, but who through successive postponements remained in the country for seven years, during which time she married. Not having become a public charge within the five years specified by the Immigration Act, she is now a permanent resident. She has given birth to two children who are living. What will her descendants be?

Needless to say immigrants from different stocks and from different countries show varying peculiarities and tendencies. We are given a chapter on European ethnogeny which goes into the migrations before the time of Christ which were responsible for the make-up of the populations of Europe, followed by a study of ten decades of immigration into the United States, largely statistical, but giving an insight into conditions as they exist. Other subjects of great interest are discussed, but the most important from the standpoint of the study are those relating to the mental health of the new arrivals, and of their progeny, which is dependent to some extent upon their origin. In the State of New York only one-fourth of the general population is foreign born but furnishes almost one-half of the first admissions to institutions for mental diseases, and there are indications that the admissions increase in proportion during the after years of their residence.

The type of disturbance is particularly interesting. Admissions to the 62 state hospitals on account of syphilitic brain diseases amounted to 11.3 per cent for all races. Dividing these into groups, the Sinitic gave 17.2 per cent, the Indo-Eranic 20.6 per cent, the Negritic 14.7 per cent, the Lettic 14.5 per cent, Italic 13.8 per cent, Finnic 13.4 per cent, Chaldaic 12.6 per cent, while the Teutonic group were only three-tenths of one per cent above the average. The Anglo-American, by which term is meant people who have lived in the United States for two generations or more, the Slavonic and Malayic showed the lowest rate of admissions for this type of brain disease. Mental diseases due to senility and arterial changes are more common in the Teutonic and Celtic stocks. The Celtics are more prone to develop intoxication psychoses than any other. The Irish rank first in disorders due to alcohol, the Slavonic stocks being also high. The Hellenic, Indo-Eranic and Chaldaic show the lowest rate of intoxication disorders. Benign mental disorders are more frequent among Malayic, Anglo-American, Chaldaic and Sinitic in the order named. The Anglo-American, Tartaric and the American Indian rank highest in mental disorders due to abnormal personal make-up.

During the twenty-two years under consideration, Mexicans and Irish lead in the rate per 100,000 debarred for mental disorders. The difference between the

South Italians and North Italians is tremendous, the rate for the former being almost double that for the latter, while the Croatians and Slovenians show the lowest rate of all.

There is not a chapter in this bulletin that is not worth the reading. With our tremendous increase in population and the often demonstrated fact that the upper classes and best stocks are not maintaining their numbers, while the least desirable, and even the unfit, are doing so, gives special importance to this excellent study.

1. Mental Hygiene with Special Reference to the Migration of People. By Walter L. Treadway, Surgeon, U. S. Public Health Service, *Pub. Health Bull.*, No. 148.

ANTHRAX IN ZOOLOGICAL GARDENS

AN INTERESTING story comes to us from England.[1] Two elephants in the London Zoölogical Gardens, which were not only fine specimens in themselves, but were also trained, giving them an especial value, died of an acute infection which terminated fatally within forty-eight hours after the first symptoms. The postmortem on the first animal was not done immediately, and the diagnosis failed through disappearance of the anthrax germ due to decomposition. Cultures made from various organs, as well as the foamy appearance of the liver, made the pathologist believe that the infection was due to the *Bacillus aerogenes capsulatus*. The real nature of the disease was not suspected until the death of the second elephant, upon which a postmortem was done almost immediately, while the body was still warm. Microscopic examination of fresh smears showed the characteristic bacilli of anthrax, cultures confirming this diagnosis. Proof that the first elephant had also died of anthrax came six days after its death when an attendant noticed a pustule on his wrist, which had apparently started in a hair follicle, and which was shown to be anthrax by bacteriological examination. As he had not come in contact with the second animal in any way, this was positive proof that the first elephant, with which he had come in contact, had suffered from anthrax.

Making postmortems and disposing of the carcasses of elephants are not easy, and in the necessary handling of such a mass of material, there is much danger of spreading the infection. Each of the animals under consideration weighed approximately three tons.

Up to the present time all attempts to trace the origin of the disease have failed. Needless to say some food stuff is suspected. It is said that anthrax is a veritable scourge in elephants in countries like Burma, where it is estimated that more than 5,000 die yearly of this disease, but it has never before been seen in England nor in this country as far as the writer is aware.

From the public health standpoint, three observations stand out. First, anthrax is occasionally introduced by means of supposedly safe materials, generally food stuffs or bedding. The tracing of the infection is extremely difficult. Owing to the tremendous resistance of the anthrax spore, it can be carried around the world and is invulnerable to injury by any ordinary means. The second point is the danger to attendants from an unsuspected outbreak. In the London Zoölogical Gardens, four persons who took part in the handling of these animals contracted anthrax. Prompt diagnosis and treatment prevented any serious result. The third point is the opportunity given for the accurate determination of the incubation period, which was six days. It is pointed out also that the initial sore is painless, and might easily be overlooked for a day or two. During the postmortem on the

second elephant, one of the attendants cut himself quite deeply. Immediate treatment prevented trouble. Prompt treatment of wounds, therefore, prevents the infection and prompt treatment of the initial lesion is very effective in avoiding serious illness. Anti-anthrax serum was used with excellent effect.

1. *Brit. M. J.*, Jan. 22 and Feb. 12, 1927.

PERSONNEL AND PLACES

IN ALMOST every plan for the development of public health work—local, state or national—the problem of securing adequately trained personnel arises sooner or later. To many this problem is considered more serious than that of obtaining funds. Because of the particular preparation required in the various branches of public health work and the relatively small number of persons equipped for any particular division, there has come the realization of a serious shortage of skilled personnel in the public health field. Insecurity of tenure, inadequate salary, necessity for long and expensive education for certain types of work and other reasons dependent upon viewpoint and background, have been blamed for this apparent shortage. As far as we know there has never been a study made to determine whether a shortage actually exists, how serious it may be, in what direction it lies, and what may be done to remedy it. Sooner or later each profession has had to study this matter, usually in connection with the facilities for training workers in its field. It is probably only a question of time when the public health profession must similarly investigate the factors which determine the character and number of trained public health personnel.

As a beginning the AMERICAN PUBLIC HEALTH ASSOCIATION has undertaken to make a vigorous and continued search for all unfilled positions. Undoubtedly, some light will be thrown on this problem if it can merely assemble and keep current a list of those places in which public health work is languishing for lack of trained workers. The first list was published in the March JOURNAL and with the coöperation of employing organizations will be continued in subsequent issues of the JOURNAL. The monthly publication of such lists will serve two purposes: It will make known personnel requirements of individual organizations; to some extent it will be a current record of the existing shortage.

ASSOCIATION NEWS

A.P.H.A. MEETS OCTOBER 17–21

THE DATE for the Fifty-sixth Annual Meeting of the AMERICAN PUBLIC HEALTH ASSOCIATION, to be held at Cincinnati, Ohio, has been definitely set for October 17–21, 1927, with headquarters at Hotel Gibson. The meeting will officially open Monday noon and close Friday noon, which is a departure from the schedule of sessions of previous annual meetings.

A significant feature of the selection of Cincinnati for this year's meeting is that the Association held its first Annual Meeting in that city the first week of May, 1873.

Dr. John E. Monger, State Director of Health of Ohio, announces that the regular Conference of the Ohio Public Health Officers and Public Health Nurses and the Ohio Society of Sanitarians will be held in conjunction with the Annual Meeting of the AMERICAN PUBLIC HEALTH ASSOCIATION.

A.P.H.A. AT SOIL SCIENCE CONFERENCE

AT THE International Conference of Soil Science to be held in Washington, D. C., June 13–22, F. C. Blanck, Ph.D., Chief, Bureau of Chemistry, U. S. Department of Agriculture, will represent the American Public Health Association. Dr. Blanck is a Fellow of the A.P.H.A. and a member of the Committee on the Control of Meat, Milk and Other Dairy Products.

PENNSYLVANIA

DR. COLCORD HEADS ALLEGHENY COUNTY ASSOCIATION

AT a meeting of the executive committee of the Allegheny County Public Health Association held at the University Club, Pittsburgh, March 25, Dr. A. W. Colcord of the Carnegie Steel Company was elected president.

Since its organization in the fall of 1925, the Allegheny County Public Health Association has accomplished several outstanding pieces of public health work in Western Pennsylvania. Under the auspices of this association a successful meeting of the State Association was held January 21–22.

The County Association has sponsored intensive toxin-antitoxin work in Allegheny County. It has also interested some of the large industries of the county in better public health for the communities in which they are located.

LIST OF NEW MEMBERS

Warren T. Acker, Scranton, Pa., Vice-Chairman Survey Committee, Scranton, Pa. (Assoc.)

Peter F. Amoroso, M.D., New York, N. Y., Member of the Executive Committee of the East Harlem Health Center (Assoc.)

Caroline Crossdale, M.D., Albany, N. Y., Professor of Hygiene and College Physician State College

Edgar S. Everhart, M.D., Harrisburg, Pa., Chief, Venereal Disease Section, Pennsylvania State Health Department

Joseph B. Glancy, B.S., Allston, Mass., Bacteriologist for Bluepoint Co., Calf.

Harry P. Gouthro, M.D., Halifax, N. S., Immigration Medical Officer Department of Health

Julia W. Huntington, Norwich, Conn., Committee Work for National Organization for Public Health Nursing

Selma Jakubowska, R.N., Buffalo, N. Y., Industrial Nurse, General Chemical Company

Henry H. Kessler, A.B., M.D., Newark, N. J., Medical Director N. J. Rehabilitation Clinic; Medical Advisor N. J. State Department of Labor

Oscar R. T. L'Esperance, M.D., Boston, Mass., Private Practitioner

Mary C. Lincoln, R.N., Binghamton, N. Y., State Nurse, Division Maternity, Infancy and Child Hygiene

H. DeForest Lockwood, M.D., Meriden, Conn., Health Officer

Mathew J. Martinek, B.S., Chicago, Ill., Senior Sanitary Chemist, Chicago Department of Health

R. E. McClure, M.D., Quitman, Ga., Commissioner of Health

Frederic J. Moss, C.E., Chicago, Ill., Assistant Sanitary Engineer, U. S. Public Health Service Milk Investigations

Juan A. Orellana, M.D., Santiago, Chile, Chief of Department of Laboratories (Assoc.)

Florence Stein, R.N., New Philadelphia, O., Supervisor of Health, County Board of Education

J. Paul J. Williams, B.S., M.S., C.E., New York, N. Y., Teacher Sanitary Engineering, Cooper Union

BOOKS AND REPORTS

Leadership—*By William C. Rucker, M.D., Dr.P.H., Surgeon, U. S. Public Health Service. New York: Macmillan,* 1926. 171 pp. Price, $2.25.

As indicated in a sub-title, this small volume is a manual on conduct and administration. A foreword by the Surgeon General of the United States Public Health Service calls attention to the ever-widening horizon of the public health field which makes it necessary that those who labor in it shall be possessed of the highest moral, mental, and professional qualifications. "Above all, they must be men and women of outstanding character imbued with the noblest ideals of service and equipped to assume leadership in this most vital of all the arenas of human endeavor."

One chapter is devoted to Self-Leadership and contains the following suggestive headings which may serve to indicate the types of problems discussed: The quality of gentleness, tact, courtesy, impartiality, personality, dignity, pride, courage, imagination, truthfulness, gossip and criticism, patience, promptness, industry, initiative, physical fitness, personal appearance, professional fitness.

The book contains seven chapters, in which are discussed general considerations of leadership, the basics of character, self-leadership, leadership of Service personnel, the leadership of the public, relations within the Service, and the values of leadership and allegiance. While the book has been written primarily for the Public Health Service, it should prove of interest and value to hospital administrators and sanitarians generally. IRA V. HISCOCK.

A Treatise on Pneumonic Plague—*By Wu Lien-Teh, M.A., M.D., B.C. (Cantab.); C.P.H. (Johns Hopkins); Hon.Litt.D. (Peking); LL.D. (Hong-Kong); Sc.D. (Shanghai). Geneva: League of Nations Health Organization,* 1926.

This monograph, the field work for which was begun in 1910, and which is "reverently" dedicated to the martyrs who sacrificed all in fighting and investigating pneumonic plague, is the outgrowth of varied personal experiences and untiring investigation of the literature. The result is a most complete and valuable contribution to the subject of pneumonic plague.

The material is well organized, and deals with the history, epidemiology, clinical features, immunity, and prophylaxis of the dread disease. Each chapter closes with a bibliography. Supplementing the printed pages are photographs of infected victims, pathological tissues, and the hospital in Harbin, China, where much of the author's work was done.

An almost unbelievable amount of data is crowded into the 450 pages. No corner of the world has been left unsearched for case reports and other findings, and it is not hard to understand why Dr. Lien-Teh quotes Ssu Ma Kuang, the Chinese historian: "Shih ch'i nien shih ch'eng" (It has taken seventeen years).

Contrary to the author's modest statement, it is not "dry reading." Even technical details are made interesting. The book is exceedingly well written, and with a certain breeziness that reflects American associations.

It is to be recommended as a reference on any phase of pneumonic plague, and will undoubtedly find a welcome in all medical libraries. M. P. RAVENEL

Primary Gymnastics. The Basis of Rational Physical Development—*By Neils Bukh. New York: Dutton,* 1926. 148 pp. Price, $2.00.

During the last few years there has been a great rise in interest in the so-called Bukh system of gymnastics. This small treatise covers this type of physical activity in an interesting way.

It starts with a discussion of the aims and plan of the work, and then in detail enters into the discussion of the various exercises.

These exercises are largely of the formal type and designed to be corrective. A considerable proportion of them are done with the use of such heavy fixed apparatus as the stall bars and the Swedish boom. The exercises are based on Swedish medical and corrective gymnastics. They contain a considerable element of stretching exercises, which might be valuable as preliminary training for a contortionist, but seem hardly essential as a part of one's educa-

tion in physical activities, or as a health measure. They have a value for the use of the "tired business man" type, as the performer gets the massaging effects of stooping, stretching, and bending, as well as the psychic effects of effort.

For the use of specialists in medical and corrective gymnastics, many of these exercises would be valuable. They may be adapted to the use of the individual or of the group. The use of them by the ordinary college or public school instructor in physical education, however, is hardly essential. We already have too many *systems* of physical education.

There are many illustrations of the exercises.

CHARLES H. KEENE

Sewage Treatment and Disposal—A Manual for Municipal and Sanitary Engineers and Managers of Sewage Disposal Works—*By G. M. Flood, B.Sc.Eng., A.M. Inst. M. & C. E., F.I.S.E., M.R.San.I. London: Blackie & Son, Ltd.*, 1926. 163 pp. 10s. net.

This condensed manual has been written for the benefit of public health engineers, works managers and others desiring to become acquainted with a complicated subject. The author's teaching experience at Manchester well qualifies him for presenting the subject in a lucid manner.

The arrangement of the book is excellent and follows logically both the development of the art and the methods of attack in practice. The eight pages devoted to the development of sewage treatment are well worth reading also those entitled "Objects of Treatment," "Characteristics of Sewage," "Physical Aspects of Sewage Treatment" and "Micro-Biology of Sewage."

Then follow chapters describing the methods of sewage treatment. These are written in commendable style and are free from matter of interest to antiquarians only. They are illustrated and while necessarily condensed, are calculated to emphasize the important points of methods and devices and works adapted to British conditions.

Two chapters entitled "The Diffused-air Method of Treatment and Other Methods of Oxidation without Filters," comprise what is called the Activated-Sludge process in this country. Considerable space is given to the engineering of compressed air.

Naturally the 13 pages devoted to 20 trade wastes and their disposal are rather sketchy but the mental pictures are clear.

The methods of estimating population and volumes of sewage, also methods of chemical analysis of sewage and effluent are given in considerable detail. The analytical methods include three for nitrogen as nitrates but none for biological oxygen demand.

The author appreciates the paramount importance of sludge treatment and while citing sludge digestion with gas collection as an interesting promise, and with no reference to American experiences, he believes the most economical method of disposal to be by spreading on land. The discussion of the conservation of sludge nitrogen by dewatering and drying is conservative and no successful attempts are recorded.

Chapters on "Design" and "Costs" give data which while interesting are naturally related to British sewage and conditions.

As a first reader on sewage treatment the book may be hgihly recommended.

ROBERT SPURR WESTON

The Fundamentals of School Health—*By James Kerr, M.A., M.D., D.P.H. New York: Macmillan Company*, 1927. 859 pp. Price, $10.00.

This book sets a new standard for works on school hygiene, not only in the enormous amount of subject matter, but in the thorough way in which it is all treated.

It does not lend itself readily to review, discussing as it does so many different subjects. Beginning with heredity, it considers every possible influence which may affect the growth and condition of the child, mental, moral and physical. Crippled and mentally subnormal children receive adequate space and chapters are devoted to the deaf, those of poor vision, stammering and other defects of speech, congenital aphasia, and right and left handedness. Indeed, the 43 chapters which make up the book consider the child from its birth through the entire school period. The reviewer has failed to find any germane topic which has been omitted. School nursing, the health of teachers and the infectious diseases receive more than usual attention. The chapter on ventilation is up to date, beginning with the history and underlying principles, and even going into the use of the Kata thermometer and its application to school requirements. The last chapter is devoted to statistics.

While the author shows great familiarity with literature of the entire world, the book is notable for the large number of references to

American work. Credit is given to correspondents and workers all over the world as having aided in what otherwise would have been practically an impossible task, and the pages give ample evidence of these extensive studies.

The illustrations are abundant and excellent. Every page bears the impress of a master who has not only assimilated the literature, but has drawn from a rich personal experience. As stated in the preface, "The hygiene of the growing age as a scientific study is more important nationally than that of any other period," and the impress of this conviction is seen throughout the book. It is excellently printed on fairly light paper, a matter of considerable importance in so large a book. It is singularly free from errors, but on page 80, Kimball instead of Kendall, is credited with having isolated thyroxin. Kimball is correctly credited with his work in the prevention of goiter by the administration of iodine. The name of the artist Puvis de Chavannes is misspelled.

The reviewer knows of no single book on this subject which contains such a wealth of information expressed in such readable fashion. As a book of reference it is unequalled.

M. P. RAVENEL

Das Krebsproblem, Rückblicke und Ausblicke, Grund- und Scheinprobleme der Krebsforschung, -Behandlung und -Verhütung—*Klinish - biologische Darlegungen von Dr. Alfred Greil. Leipzig: Verlag von J. A. Barth,* 1925. x+182 pp. Price, M. 6.00.

This is a discussion of the cancer problem from the biological point of view. Its interest lies in the author's elaboration of his own hypothesis—as yet only one of many—and his presentation of 30 other hypotheses. To each of these he enters explicit demurrers as to their validity, and shows their inherent weaknesses or inadequacies. He founds his hypothesis on neither exogenous nor endogenous determinants, visible or invisible cancer germs, but rather on fundamental processes of epigenetic evolution and variation. Cancer is thus not of parisitic origin, but rather a phase of the epigenetic evolution of cells. He stresses the importance of our overcivilization and its effect on reproductive functions. The neoplastic diathesis, according to the author, is a metagamic (postconceptional) acquirement resulting from abnormalities of the maternal-foetal metabolism and the common property therefore of all the cells of the body. This divergence from the norm thus established later calls forth differential mitoses in many ways at different times at critical phases of development which result in neoplasms. These are, therefore, special forms of variations in cells and tissues and their investigation lies in that field and not in that of infections. Prevention lies in regulation of man's mode of life, especially of his reproductive processes, and treatment should be constitutional and general rather than local. CHARLES A. KOFOID

Hygiene—*By Florence Lyndon Meredith, M.D., College Physician, Professor of Hygiene, Smith College. Philadelphia: Blakiston's,* 1926. 719 pp. Price, $3.50.

Courses in hygiene now have an assured place in college curricula. The students in these courses often have no scientific background, so the subject matter must be presented in an understandable, and more or less elementary fashion.

Dr. Meredith, a teacher of hygiene, offers her book as a text and reference for such students. She has utilized her own experience both in the practice of medicine and in teaching, and has drawn freely from recognized sources of information, which has resulted in a very thorough treatment of the subject.

There are 4 main divisions to the book, with appendices which give a table of chemical composition of American food materials, 100 calorie portions, and a bibliography.

An introduction contains general information regarding health and disease, the prevention of disease, and the proper attitude toward health.

Part Two, "Anatomy and Physiology," gives definite instruction on these subjects so necessary to an interpretation of the later chapters.

Part Three, "Pathological Conditions," includes a rather brief treatment of infection, resistance, poisons, accidents, etc.

The main division of the book—covering fully half the pages—is called "Hygiene," and it is here that the text really begins to be specialized in subject matter. A thorough and comprehensive discussion of personal hygiene is given. The chapters on Sleep and Rest, Food and Diet, and Hygiene of the Nervous System are especially good. The relation of the individual to society is not neglected.

The reviewer closes the book with a great admiration for the thorough way in which the subject has been treated. The material is presented in a careful and exact manner which leaves little to be desired as to content. The

author's sane and well-balanced viewpoint is excellently portrayed. An outstanding feature is the large number of illustrations, all excellent, and from standard authorities.

The only regrettable feature is the rather prosaic style in which the book is written, its very correctness tending to create this impression. It is understandable, but not a text that would tempt the student to read more than the assignment. Imagination is lacking, and one wonders if its value would not be enhanced by a somewhat more popular handling of subject matter.

The book is excellently gotten up, the paper and printing are above the average, and it will be an addition to any reference list.

M. P. RAVENEL

The Health of the Teacher— *By James Frederick Rogers, M.D. School Health Studies, No. 12. Department of the Interior, Bureau of Education,* 1926.

Dr. Rogers, Chief, Division of Physical Education and School Hygiene, has made a comparative study of the amount and causes of disability among teachers and industrial workers in London and in several large cities of the United States. In his pamphlet on the *Health of the Teacher,* the twelfth of a series of school health studies, he also outlines a program designed to increase the efficient teaching.

It is noteworthy that teachers as a class are remarkably healthy, and that their health remains superior, when the number who are sick and their length of absence are compared with the records for industrial and clerical groups. This statement, however, is inconclusive in that the teacher is not obliged to work the same length of time throughout the year as persons in other occupations.

The teacher is not, as was once supposed, more subject to diseases of the respiratory organs (cold, tonsillitis, influenza, pneumonia, tuberculosis, etc.) than are other indoor workers. Diseases of the digestive organs are less common among teachers than among other groups studied, due, probably, to the teacher's greater knowledge of hygiene. In regard to nervous disorders, however, evidence is presented to show that disability and absences caused by diseases of this type (neurasthenia) excel among the teaching group and are far greater than they should be. Dr. Rogers suggests that the high percentage of nervous troubles among teachers in contrast to other groups is due largely to the wear and tear of dealing with people on the one hand compared to the objective business of working with things on the other. The average number of days' absence of teachers for the school year is stated to be 3.36 (1.50 men, 3.49 women), while that for other occupations (annual average reduced to $\frac{2}{3}$) is 3.39 for men and 8.40 for women.

Turning to a health program, Dr. Rogers divides the responsibility for the health of the teacher among 5 groups: the training school, local board, supervisors, community and the teacher herself. Teachers should be trained physically as well as mentally to fill their positions, and so it is that a large responsibility rests with the training school and its choice, care and preparation of prospective teachers. Upon entrance, applicants should be given a thorough physical and mental examination by a first-rate physician employed by the school, and those unfitted for teaching should be rejected immediately. The student-teacher should be taught the principles of school and personal hygiene and be experienced in their application.

The local board shares in the responsibility of the training of the teacher by furnishing the most healthful working conditions in the school, by erecting comfortable teachers' homes, and by paying a salary sufficiently large to assure competent, efficient teachers. The provision of pensions and the granting of sabbatical leave can not but improve the working quality of the teacher by removing a source of friction from the mental machinery. Medical supervision and sick leave, the latter not exceeding 10 days a year with pay, are beneficial and are fast becoming fundamental parts of the school system. The school principal or superintendent can increase the efficiency of the teacher by creating a coöperative atmosphere which consists in being thoughtful of the happiness and health of those working for and with him. With the community rests the responsibility of furnishing the best physical conditions which tend to maintain the health of the teacher by means of its moral and financial support. Last but not least, is the responsibility of the teacher herself, which is to give her best to her school and to her community. To do this she must follow the rules of health, of eating properly, dressing in good taste, sleeping 8 or 9 hours a night and avoiding needless fatigue during the day, keeping well physically, taking time each day for recreation and exercise, and having an interest or hobby in work outside of school

hours. It is necessary for her to know her children mentally and physically, to see that they are surrounded by hygienic conditions, and to report any cases of sickness to the school physician.

A number of states require prospective teachers to pass a medical examination as an additional security to the welfare of the community. State laws and regulations are in existence which aim to improve the school buildings, sanitation, water supplies, etc. One hundred and fifty of the larger cities have provisions similar to the state regulations for improving and safeguarding the health of the teacher. The article concludes with a number of interesting and enlightening tables which show the faculty and student health supervision in teacher-training institutions in each state in the United States. R. E. W.

Chronic Infection of the Jaws. *A Short Radiological and Clinical Study—By Stanley Colyer, M.D. (Lond.), M.R.C.P., D.M.R.E. New York: Macmillan,* 1926. 75 pp. Price, $3.25.

The author has given us a thoughtful book based on an extensive experience as radiologist, during which he was associated with leading dental surgeons.

He prefers to get away from the general terms "oral sepsis" and "pyorrhoea alveolaris," and in place of these to give these troubles a name which indicates their true character and importance, "chronic osteomyelitis." He assumes that the relation of these chronic infections of the jaws to general diseases has been proved, so the object of his book is rather to point out the importance and frequency of this condition and to show how the X-ray can assist in making the diagnosis. Rightly he points out that the earlier the diagnosis is made, the better the prospect for successful treatment.

The book will probably offend some of the orthodontists, since the author is convinced that during the regulation of teeth in children, permanent damage is often brought about. He adduces radiological evidence for this opinion and shows examples in the illustrations. He gives the points to be observed in reading dental films and points out the difficulties encountered. The reviewer has recently seen a case in which a general practitioner attempted to diagnosticate a dental film and declared the patient to be suffering from apical infection, due to the fact that the X-ray was taken at a wrong angle and the mentum foramen was brought into line with the root of the tooth. A properly made film showed the tooth to be in perfectly good condition.

The latter part of the book is taken up by a synopsis of a series of fifty illustrative cases by Reginald Curnock, dental surgeon to the Mildmay Mission Hospital. The book is abundantly illustrated with well selected radiographs. While we believe thoroughly in the dentist as a specialist who should be consulted by the general practitioner, we also believe that the average physician should know the fundamentals of the subject.

This book, of less than a hundred pages, can be commended to dentists and physicians alike.

M. P. RAVENEL

Les Maladies des petits Animaux Domestiques et leur Traitement. Le Reméde á coté du Mal—*By Abel Dassy. (Paris: Mourice-Mendel,* 1923). 97 pp. Price, 6 francs.

This booklet is issued in the series *Libraire Spéciale Agricole* of the Institut National Agronomique. It contains in convenient form alphabetical lists of the diseases of cats, dogs, fowls, rabbits, guinea pigs, pigeons, cage birds, bees and silkworms. Each ailment is briefly characterized and explicit directions are given for its treatment. Hygienic and sanitary measures for the prevention of contagion are also suggested for some of the communicable diseases, and dietary mesaures in diseases where these are indicated. All who have the task of maintaining stocks of healthy laboratory animals will find this booklet useful.

CHARLES A. KOFOID

Eugenical Sterilization: 1926, Historical, Legal, and Statistical Review of Eugenical Sterilization in the United States—*By Harry H. Laughlin. The American Eugenics Society, New Haven, Conn.,* 1926. 75 pp.

This is the latest of the several publications on this subject by the author, who more than anyone else in the country has kept us informed of what was going on in the various states. As stated in the preface, it brings down to January 1, 1926, "the complete record of the legal, legislative and administrative aspects of eugenical sterilization . . ., provides a critical analysis of the facts and tendencies, and prints the model state law."

The work has been thoroughly done and the material it presents is indispensable to all interested in this very important subject.

M. P. RAVENEL

Ventilation and Health—*By Thomas D. Wood, M.D., and Ethel M. Hendriksen. New York: Appleton,* 1927. 210 pp. Price, $2.00.

The public as well as health workers and educational authorities are indebted to Dr. Wood and Mrs. Hendriksen for presenting in *Ventilation and Health* the results of recent English and American investigations of the factors which make for good or bad ventilation of buildings as judged from the health standpoint. The scope of the book is limited to buildings; the ventilation of mines and tunnels is not treated.

It is only within the last 20 years that we have been brought to the realization that in general the health qualities of air are physical and not chemical; that attention must be paid to temperature, humidity and air motion rather than to the relative quantities of oxygen and carbon dioxide.

Following the presentation of this modern conception, the authors discuss ventilation practices, the ventilation of schools, and ventilation laws. It is pointed out that although comparative tests conducted in New York City Schools demonstrated that children in classrooms supplied with fresh air through open windows, showed significantly less respiratory illness than did children in rooms ventilated by mechanical systems, the laws and regulations governing the ventilation of schools in half our states provide that 30 cubic feet of (fresh) air shall be supplied for each child, each minute. Because this performance cannot be guaranteed, this requirement prohibits employing the open-window-gravity-exhaust system. Thus antiquated laws, based on a discredited and generally discarded theory, prevent thousands of children from enjoying the benefits of our present knowledge.

An accurate thermometer and its exposure where it will give representative readings for the occupied space, constitute the first step toward healthful atmospheric conditions in the classrooms. The second step, equally important, is to keep a permanent record of the temperature readings taken 6 or 8 times daily during the heating season. Merely providing thermometers will not correct overheating. Record-keeping focuses the teacher's attention on temperature and remedial measures can be taken when overheating threatens.

The chapters on factory ventilation, ventilation for general use, ventilation costs and devices to aid ventilation appear inadequate. Further, they contain definite statements on controversial points, and so many references to the accomplishments of one particular worker in the field, as to give this section the character of a professional announcement.

To suggest that the intricate problem of adequately ventilating continuous-performance theaters in this climate (New York) throughout the year can be solved by employing modified window or any other system of natural or gravity ventilation appears unjustified. On the other hand, school auditoriums and churches, which are used intermittently and usually for relatively brief periods, may, under certain conditions of floor and air space, exposure and outdoor temperature, be adequately ventilated by this method. No general rule can be given to govern all such cases, however; each separate problem must be studied and solved individually.

In their enthusiasm to emphasize the virtues of natural ventilation, it appears that the authors have fallen into the error of condemning mechanical ventilation in general. However true may be the opening statement in the last paragraph on page 150—"The waste in ventilation begins with the installation of a mechanical system"—in numerous specific instances, the implication that systems of mechanical ventilation in buildings are always superfluous and wasteful is contrary to the daily experience of thousands of industrial plants and greatly weakens the force of the excellent advice in the paragraph that precedes it.

Descriptions of the sling psychrometer, the vane anemometer, and the recording wet and dry bulb thermometers might have been included to advantage in the chapter on Ventilation Instruments. The chapter on Educational Methods is filled with practical suggestions that will be welcomed by the average health worker.

Ventilation and Health is one of a very few books dealing with this newer knowledge of healthful ventilation, developed in England by Leonard Hill, and his coworkers of the Medical Research Institute, and in the United States by the New York State Commission on Ventilation, and more recently by the American Society of Heating and Ventilating Engineers in their Research Laboratory, at the U. S. Bureau of Mines, and it is because of this, and the practical suggestions that the book is valuable.

That inaccuracies have survived the editing of this work; that descriptions of apparatus and procedures are often inadequate, and that personal opinions have at times been substituted for statements of fact, are to be regretted.

THOMAS J. DUFFIELD

Some Tendencies in Health Education—*A Review of the Health Programs in Sixteen Teacher Training Institutions. New York: American Child Health Association,* 1926. 112 pp. Price, $.50.

This book will answer the needs of many health education directors who want to find out how others are conducting their courses in health education, what are the elemental requirements and how the course is developed. In a sense, the book is a laboratory manual, for after briefly sketching the evolution of health education courses and discussing the health of the student teacher, the integration and administration of the health education program are given with a few examples of complete health programs. Programs of the teacher training institutions selected are geographically distributed—Towson, Maryland; Honolulu, Hawaii; Kearney, Nebraska; Oswego, New York.

Part II comprises the Addenda which offer equally valuable information regarding the Cincinnati conference, correlation of departments and activities, student health service, the better food demonstration at Ypsilanti. The subjects of mental and social hygiene in colleges and normal schools are treated in individual chapters. A valuable entry in the book is the replica of a record card for health examinations.

The report is based on the material submitted by applicants for the European Traveling Fellowship, in February, 1925, financed by the Metropolitan Life Insurance Company and offered by the Health Education Division of the American Child Health Association.

The report does not claim to present a complete or ideal program. It depicts the trend in health education in a few of the teacher training institutions in a sane and stimulating manner. Every educator interested in the training of student teachers would do well to own a copy of this report: it points out the difficulties of the past, the trend of the present and suggests topics for further research and study.

C. M. MUNSON

Reluctantly Told—*By Jane Hillyer. Introduction by Joseph Collins, M.D. New York: Macmillan,* 1926. 205 pp. Price, $2.00.

Mental hygiene is a subject too little known to the public and even to the medical profession in general. Insanity has been considered a disgrace and is not understood. When Mr. Beers gave his book "The Mind that Found Itself" to the public, it met with an immediate and widespread response. It was practically the first story which had been given to the reading public on the matter. The present book is a fitting companion piece to it. It is the story of a highly educated and sensitive woman with a psychopathic inheritance who went through four years in sanatoria and insane asylums, part of the time going down hill mentally, part in an abyss of blackness of which for a long time she had no recollection, and partly on the upgrade when she was regaining her balance and coming back to normal.

We venture the statement that no more thrilling story has ever been told. The writer has excellent use of English and a wonderful gift for expressing herself. One is almost inclined to think at times that the book is a bit of fiction, but the introduction, written by Dr. Joseph Collins, assures us that the case has been thoroughly investigated and is unquestionably a true record of the facts and the patient's recollection of them. We find a number of keen observations and suggestions. In spite of what she went through, she states that she met with a great deal of kindness, but little or no real intelligence or understanding. In two instances there was some brutality shown.

It must be pointed out that conditions in asylums and sanatoria have greatly improved since this experience. Things are now understood which were not clear at that time, and treatment has kept pace with knowledge.

For the student of insanity, the part of the book which tells of the mental descent will probably be most interesting. As the writer of the introduction says, more can be learned about the mind when it is disintegrating than when it is integrating. For the average doctor and the public, we believe that the return to normal will be the most fascinating story. Even those who are sane can learn valuable lessons from the indomitable courage, clear perception of facts and persistent fight which this handicapped woman put up so successfully, and from her present calm but plucky recognition of facts as they are, and the prospect of the ten years which she seems to think will prove the permanence of her recovery. She lays stress on the necessity of intelligent after care, and her tributes to a psychologist and a specialist who helped her through this period are no less sincere than that to the woman doctor who stood by her in the hospital.

A wonderful story, beautifully and wonderfully told, which we can commend to the attention of the profession as well as to laymen.

M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

National **Tuberculosis Association**—The twenty-second annual report of the National Tuberculosis Association indicates progress in the control of this important disease and a recognition of the value of a well-rounded public health program. The activities of the Association and of its affiliated groups have expanded to include, in certain instances, campaigns for the prevention of heart disease, for the prevention of diphtheria, and for the promotion of general clinics. It is pointed out that practically every tuberculosis association is engaged in some form of child health activity, and that more is spent upon child health education than upon any other single authorized form of work. It is concluded that the tuberculosis problem, although less acute than it was 20 years ago, is still unfinished; that where the definite fundamentals of anti-tuberculosis work have not been completed, further efforts should be made to bring about other accomplishments; and that when these fundamentals have been undertaken and the activities specified thereunder are maintained, a certain proportion of funds may be profitably diverted to an attack upon some other disease which has become an important and serious factor in the life of our citizens.

During the year a coöperative arrangement has been established between the National Tuberculosis Association and the American Heart Association, whereby the two organizations occupy the same office and the former serves as secretary for the latter. This coöperative plan resulted from a discussion of the similarity of machinery used in carrying on the work of the 2 associations throughout the country.

The program for the year has been arranged in the form of definite projects, and in preparing the budget an estimated amount of expenditure for each project was given. Progress in carrying out these projects during the year is reported and should prove of interest to health officials. In connection with the report of the Continuing Committee on Progress of Health Work in Framingham, it is interesting to note that the Framingham general death rate from all causes for the year 1925 was 11.2 per 1,000, the lowest in the history of the community. The infant mortality rate was 67.7 per 1,000 born. The tuberculosis death rate was 52.1 per 100,000, which was a slight fraction below the 1924 rate. The expenditures for health work remained approximately as for the past two years; that is, $2.75 per capita from public and private sources. This includes appropriations by the health and school departments, as well as contributions from voluntary agencies and for industrial services.

Racine, Wisconsin—Racine's health department report for 1926 is an excellent example of how a health officer may prepare a comprehensive and enlightening report at a minimum cost ($58.00 for 125 copies). This is a mimeographed report of 40 pages, size 8⅛" x 10¾", bound in durable brown covers with a front cover well arranged as to type and cut. An organization chart follows the title page, with the third and fourth pages given to personnel of the board nad department, and to a table of contents. The report is divided into 6 sections containing numerous tables accompanied by text, and attractive photographs and cuts. Section 6 presents the 1926 appraisal (Appraisal Form for City Health Work) in comparison with 1925, followed by appropriate conclusions and recommendations.

The budget of the department continues to show a steady growth, and for 1926 amounted to approximately 47 cents per capita on the basis of an estimated population of 69,700. A classified budget statement compares the situation during the years 1924–1927. A crude death rate of 9.4 and an infant mortality rate of 63.5 are recorded. The specific death rates for the principal causes of death were as follows: cancer 91.8, apoplexy 89.7, pneumonia 85.4, tuberculosis 51.7, chronic nephritis 33. Of the total deaths, 42.8 per cent were of persons over 60 years of age.

"The field nursing service of the health department is the backbone of the organization. It is also the point of contact between the health department and other organizations and groups working for community health." A total of 20,677 field nursing services were rendered in addition to 2,916 school visits, 35,620 inspections for contagious disease, 23,556 children weighed and measured, 553 eye tests, assistance at physical and

dental examinations (2,677), and 907 corrections secured for physical defects. There are 6 staff nurses in the field and one field nursing supervisor, in addition to the hospital nurses whose records are not included above. It is gratifying to note a carefully prepared table showing time distribution of nursing service for 1924, 1925, and 1926.

The medical service consists of field service (diagnosis and consultation), and clinics, including physical examinations, venereal disease clinic, chest clinic, and prevention clinics for smallpox and typhoid vaccination, diphtheria immunization, goiter prevention, Dick testing, and whooping cough vaccination. "There is little change from year to year in the work of the laboratory. It is the least spectacular, the least understood, but certainly one of the most useful divisions of the department. It increases the efficiency of practically every other division and renders service as well to the medical profession and the citizens directly."

Manchester, New Hampshire—The 1926 Manchester health department report indicates at the outset some public health tendencies of interest. "Thanks to vaccination, smallpox is unknown in Manchester." Diphtheria prevention work began in 1921, and the rate has dropped from 469 cases with 31 deaths in that year to 12 cases with 3 deaths in 1926.

The new milk ordinance requiring either pasteurization of milk or tuberculin testing of herds has been in operation 2 years. Over 90 per cent of the milk sold in the city is produced within a radius of 40 miles of the city, and all is produced within the state of New Hampshire.

The statistics of the year indicate a birth rate of 19.9, a crude death rate of 11.7, an infant mortality rate of 93, and a tuberculosis specific death rate of 55.

Pontiac, Michigan—Under the title "Pontiac's Healthiest Year," the health officer presents his report to the city manager. A crude death rate of 10.5 is recorded, with specific death rates from certain principal causes as follows: organic heart disease, 108.4; cerebral hemorrhage, apoplexy 94.4; pneumonia, 92.3; cancer, 64.3; tuberculosis of the lungs, 48.2; Bright's disease and chronic nephritis, 44.2; automobile accidents, 38.2, and diarrhea and enteritis, under 2, 26.1. A birth rate of 23.6 is noted, with an infant mortality rate of 74.1. It is stated that as a result of the diphtheria immunization work carried on during the past few years by private physicians, school and health department physicians, cases of this disease have been reduced an average of 199 for the years 1919–25 to 106 in 1926.

The field nursing program embraces prenatal, infant, preschool and school work, as well as communicable disease control, but the health officer suggests the need of increased personnel. The public health laboratory record since 1916 is one of progress, although, as in several other cities, the total examinations made last year were slightly less than for the previous year due to the marked decrease of diphtheria cases. The annual report for this city of 49,800 people contains many statistical tables with accompanying text, which indicates progress in disease prevention and health promotion, particular emphasis having been given to the health of children.

Framingham, Massachusetts — Framingham, with an estimated population in 1926 of 21,747, reports a birth rate of 21.7, a death rate of 11.2, and an infant mortality rate of 50.8. The tuberculosis death rate per 100,000 population, by legal residence was 73.6, while the tuberculosis death rate per 100,000 of cases acquired in Framingham is reported as 55.2.

An ordinance requiring all milk sold in the city to be pasteurized or from tuberculin tested cows became effective the first of the year, and improvement has resulted. The "ten-year program" of the State Department of Health for the detection of hilum tuberculosis and other causes of underweight among school children came to Framingham in November. The infant welfare work has developed along prenatal and breast feeding lines and the infant mortality rate shown above is commendable. The average age at death in 1926 was 51.4.

York, Pennsylvania—The 1926 report of the director of public health of York shows continued decline in diphtheria morbidity, (6 cases), although there were more cases than usual for this city, of measles, scarlet fever and pneumonia. During the year over 1,500 children were immunized with toxin-antitoxin. Over 5,500 children are now pro-

tected. The average expectancy of typhoid fever cases is reported to be 12; while the number reported during the year was 8, with 3 deaths. This city with a population of 50,000, reported a general death rate of 14.6 and an infant mortality rate of 75 for the year.

An account of a sudden outbreak of typhoid (60 cases) in 1925 is very interesting. This was traced to an unreported case of the disease in September on a farm supplying milk to a pasteurizing plant. Investigation showed that the bottled pasteurized milk containers were handled by a man at the plant whose wife had the disease and who handled the raw contaminated milk from the farm.

The nursing work for the city is carried on by the Visiting Nurse Association. The eighteenth report of this organization outlines the nursing care given to the sick in their homes, the instruction given families in the simple rules of hygiene and home nursing, and the endeavors to improve the health condition in each home. Care is continued only when a physician is in attendance. Prenatal visits are made to expectant mothers and nursing care is given to both mother and baby after delivery. A special night service is maintained to care for emergency night calls and to assist physicians with obstetrical cases. Cases needing other than nursing care are brought in touch with the proper agencies. A total of 35,682 visits were made to 2,979 cases during the year by the 9 staff nurses. Three nurses are engaged in school work. The report is well illustrated with photographs and contains much statistical information.

Maternity Center Association—A commendable report of progress and health promotion is contained in the 1926 account of the activities of the Maternity Center Association. The objects of this association are to teach the public the vital importance of adequate maternity care; and to secure, in coöperation with all existing agencies, such care for all expectant mothers. Although its chief activities are confined to the vicinity of New York, as a result of its teaching, experience, and trained workers, the association's influence is felt throughout the United States and in many foreign lands.

Recently a consultation service and classes for mothers of the professional and salaried groups have been conducted. Nearly 200 mothers have already taken advantage of this service. Instruction is given regarding hygiene, food, clothing and general living during pregnancy and for confinement and the weeks that follow.

An intensive maternity program is carried on in a large district of New York City. Twenty nurses go into the homes daily to give prenatal, delivery, and postpartum care to about 1,000 mothers each year. Two subcenters are open every weekday afternoon. Fourteen ambulatory clinics are located throughout the city in centers of other organizations where there are no other facilities for care. They are staffed by women physicians and nurses and provide medical supervision for mothers who would otherwise have none.

A maternity nursing service has been established in Tioga County, New York, under the joint direction of the State Department of Health and the Maternity Center Association and has proved a great success. In 2 years, three-fourths of all the mothers in the county were under the care of the nurses. In the first year the physicians referred the majority of the mothers for care. In the second year, the physicians referred half and the other half came on their own initiative, showing that the nursing service was valued by both the mothers and the physicians.

"Two thousand mothers have been cared for and not one mother has died. Do you realize what this means? Had the rate for the city at large obtained for this group of mothers cared for by the Maternity Center Association, more than 8 mothers would have died. A saving of eight mothers!"

Office International D'Hygiene Publique—The Permanent Committee of the International Office of Public Hygiene held its regular session of 1926 from October 21 to 30, 1926, at Paris. The greater part of the session was devoted to the study of new obligations imparted to the Office by the International Sanitary Convention of June 21, 1926 and the means of meeting these obligations.

Among the problems under consideration are the following: Determination of the form of certificates of deratization and exemption from deratization; questions relative to reporting and, in particular, to the use of wireless telegraphy in sanitary operations;

and questions relating to ships' doctors, and medical and sanitary instructions intended for captains of vessels not having a physician on board.

An impressive list of communications embracing a wide variety of topics has been received by the committee and promoted profound discussions. Mention may be made here of only a few of these problems. The evolution of scarlet fever in different countries and experiments in serotherapy and immunization have been considered. In England the disease emphasizes its benign character, but experience demonstrates that complications are more frequent in the case of patients at home, even when well cared for, than in hospital cases, hence the indication of hospital care whenever this is possible. Taking into account all the data at hand, the Metropolitan Asylums Board of London decided that the order of priority for hospitalization of contagious cases should be fixed as follows: diphtheria, scarlet fever, measles, and whooping cough.

Organization of the fight against cancer has proceeded in Great Britain, France, Italy, Switzerland, Holland, Japan, and Russia; anti-cancer centers have been created for diagnosis and treatment; education of the public regarding the importance of early diagnosis and treatment has continued.

Data received indicate that general paresis is decreasing in certain countries, notably in England and Czechoslovakia. As concerns the attempts to treat this affection by inoculation with malaria, the opinion to be formed, without being definitive, is rather favorable.

Trachoma, which was extremely rare in Switzerland, is, according to reports, becoming more frequent there without imported cases. In South America, cases are rather numerous, but these are imported by immigration. There exist no epidemic foci.

Housing in Philadelphia—Housing conditions bear a highly direct relation to the individual. Hence housing is a vital part of every community for it underlies private and public health, civic interest, creative activity, and moral welfare. In recognition of this basic factor, the Philadelphia Housing Association conducted in 1925 a strenuous and energetic program of real benefit to the city and of considerable significance both to those who are struggling with this problem elsewhere and to all citizens of a civic mind.

The first section of an excellent 60-page report issued by the Association frankly sets forth a summary of housing progress. Both dark and bright aspects of the situation are indicated. According to this brochure housing progress is backward, for awakened civic spirit is lacking, governmental activity and municipal inspection service are weak. Quoting from the Bureau of Municipal Research, Philadelphia boasts of only 2.56 inspectors per million population, as against 10.2 for Baltimore, 19.1 for Detroit, and 33.2 for New York City. Adequate programs for new housing in available parts of the city are hampered by lack of sufficient rapid transit and feeder lines. Adequate building legislation is not forthcoming; "an antique building code still remains the law of constructon," and successful zoning regulations, authority for which was granted to the city by state legislation in 1915 before any city in the United States had adopted comprehensive zoning, have not yet come into activity during this period of time, in which 400 American cities have adopted zoning. High rents are forcing dwellers to convert single houses into tenement or lodging houses, the larger part of the new houses built are priced too high to accommodate the people who need homes, and building construction, largely done by small contractors, goes merrily on in disregard of the economic saving in large production and the modern use of steel and concrete.

However, the situation is not entirely dark, for the report shows optimistic trends. The outstanding feature of housing progress in Philadelphia in 1925 was the phenomenal dwelling construction program, which was greater than in any year previous in the history of the city. More houses were for sale at lower prices than at any time during the last five years. Together with this, house vacancy has increased. These two factors have led to increased removals of tenants, and in the greater margin of dwelling choice resulting, give the tenants increased opportunity to escape from unsanitary conditions where landlords will not make houses tenantable. The increased bargaining power now falling on the side of the tenants is starting a competition to force prices down. More consideration is being given by owners to upkeep and improvement of these properties than for many years. In all but one of 13 districts, dwellings were under construction to sell for $6,000 or less, as against only six districts showing such a program the year before. Suburban development is relieving con-

gestion; transit improvements are coming, a reliable "Better Housing, Building and Loan Association" has been formed, and increased study is being given to the various Model Home and City Housing Corporations. Complete details as to the statements above presented are given in three sections of the report.

The program of the Philadelphia Housing Association consists of three phases: sanitary inspection, special survey studies, and public education. The sanitary inspectors during the year made 27,370 visits to properties, uncovered 7,138 violations of the housnig and building codes, and stimulated the abatement of 5,794 such violations. The special survey portion of the Association's activity studied extensively House Vacancies, House Rents and Distribution of Rental Increases, Removals of Tenants, House Ownership, Dwelling Demolition for new construction, and New Dwelling Construction. The Public Education activity sought to bring before the public conditions as they exist. To this end, 25,000 pamphlets were circulated, 129 news articles were introduced into the daily press, and lectures given by the association were attended by 15,300 people. Throughout the whole range of its activity, the Philadelphia Housing Association coöperated closely with other voluntary associations and served as a clearing house for parts of their programs. The entire activity of the association was conducted for a year's expense of under $24,000. Altogether this 1925 report is a very frank, well divided, thorough, and stimulating presentation of an important problem.

What **Constitutes Adequate Medical Service?** *—Within late years, realization of the economic loss caused by the degenerative and permanently disabling diseases has directed attention to their possible discovery in the earlier and more easily treated stages. As a matter of fact, the situations presented by the average patient in the medical department of a clinic are frequently more obscure and difficult to interpret than those of the usual hospital case. Private medical practice, as well as medical service in clinics, faces the inherent difficulty of these cases not only in respect to diagnosis but in the accomplishment of treatment up to the point of securing satisfactory results. In contemporary medical schools and in modern literature, emphasis is laid rather on diagnosis than on the details of carrying out treatment, although it is on these details that successful results from the point of view of the patient largely depend.

With these points in mind, and with the aim of establishing some standards through which adequate service and the results of clinic care could be judged, a series of 200 cases of adults from the medical department of Cornell Clinic were carefully investigated.

While the study obviously deals with too few cases to yield a statistical conclusion, it is believed that it lays emphasis on two important and somewhat neglected aspects of medical service, namely, the analysis of the aspects of treatment which involve the intelligence and coöperation of the patient, and the formulation of criteria of methods whereby results of treatment can be systematically judged.

The study of this group of rather complex and long-term medical cases of adults has brought out strongly the large importance, in successful treatment, of defining and recording the essential medical problem of the patient as well as the diagnosis. The routine notation of a prognosis has been shown to be stimulating to the physician and useful from the standpoint of the patient. An estimate of the illness, which we have called a disability rating, has been found helpful to the physician in making plans and in judging results. Of especial importance has appeared to be the making of a plan of treatment that takes into account both the medical problem and the patient's intelligence, personality, background, and resources. The study has brought out forcibly the value of the medical-social worker in helping the physician to define the patient and to carry out this plan of treatment.

The results of this study should be developed by analysis of a larger number of cases and of cases of other medical or surgical types. At a number of points the present study is not conclusive, and it must be regarded as a suggestive contribution to medical practice rather than as a definitive account of observations or conclusions. It is hoped that this attempt may stimulate others to make similar investigations of the same problems.

* Summary of Report by Samuel Bradbury, M.D., Chief of Clinic, Medical Department, Clinic of the Cornell University Medical College, New York. Copies may be obtained without charge from the office of the Associated Out-Patient Clinics Committee of the New York Tuberculosis and Health Association, 244 Madison Avenue, New York.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Erysipelas Toxin—A study reporting the value of toxin produced by *Streptococcus erysipelatis* in preventing recurrences of erysipelas in patients who showed no natural immunity. Throughout the study there was found a serologic similarity between the scarlatinal and erysipelatis varieties of the streptococcus.

BIRKHAUG, K. E. Erysipelas. Immunization with Soluble Toxin from *Streptococcus erysipelatis* Against Recurrent Attacks of Erysipelas. J. A. M. A., 88:12 (Mar. 19), 1927.

Infant Feeding—Another consideration of the place of acidified milk in infant feeding. The authors conclude that it has a very definite value as a therapeutic food but should not be used as a routine feeding for normal infants.

BLACKFAN, K. D., and JOHNSTON, J. Notes on Infant Feeding. Boston M. & S. J., 196:10 (Mar. 10), 1927.

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BOLT, R. A. Federal Subsidies to the States with Special Reference to Health. Hosp. Soc. Serv., 15:3 (Mar.), 1927.

Health Promotion—"The community's responsibility for health education is synonymous with the community's responsibility for health conservation, because the education and information of the public must precede the application of any active measures for health conservation." This is the Surgeon-General's text for a talk on the place of the profession in the health education movement.

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CUMMING, H. S. The Future of Disease Prevention. The Forum, 77:4 (Apr.), 1927.

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KELLOGG, J. H. Diet Fads. Illinois M. J., 51:3 (Mar.), 1927.

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PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Standard **Milk Ordinance**—Leslie C. Frank, Sanitary Engineer for the U. S. Public Health Service, has reported in *Public Health Reports* for March 11, 1927, the benefits derived in 14 Alabama towns where the Standard Milk Ordinance of the U. S. Public Health Service has been in operation long enough to warrant a summation of results obtained. There has been a marked improvement in the quality of the retail raw milk. The improvement amounts to 115 per cent according to the measuring stick employed by the author. There has also been an improvement of 97 per cent in the quality of raw milk delivered to pasteurization plants, and better care is exercised in the pasteurization process.

Of special note is an increase in the percentage of milk pasteurized, the percentage for the group of towns as a whole increasing from 6.9 to 21.6 per cent, and the number of towns provided with pasteurized milk increasing from 3 to 9, 5 of these now having over 50 per cent of their milk pasteurized. There is also recorded a 90 per cent increase in the consumption of market milk.

It is gratifying to note the steady improvement in milk sanitation. The number of epidemic outbreaks attributable to milk is continually diminishing.

Several large cities in which 98 to 99 per cent of the milk supply has been pasteurized during the past decade are now tightening up on their regulations and gradually eliminating all raw milk, not excluding certified milk.

Scarlet **Fever Complications**—The *Weekly Health Review* of the Detroit Health Department for April 9, 1927, calls attention to the fact that during the first three months of the year 1926 there were 1,834 cases of scarlet fever in that city. Of this number a total of 97 or 5.3 per cent developed complications involving discharge from glands, ears, nose, etc. These 97 cases were quarantined for periods varying from 38 to 49 days from date of onset. After release from quarantine, of these 97 cases, there developed a total of 6 secondary cases (one of these 6 was rather doubtful) or 6.2 per cent. These secondary cases developed at intervals from 3 to 18 days after such release from quarantine.

In view of this relatively small percentage of secondary cases developing, even where complications involving discharge are existent, there is considerable question as to whether it is justifiable to maintain quarantine for such long periods of time as 38 to 50 days. Would there result a larger percentage of such secondary cases if quarantine were released, as in uncomplicated cases, at the end of 28 days? Quite obviously this question could not be answered except by actual experiment. Would not such an experiment be worth while?

Use of Appraisal Form—In preparing the *Annual Report*, as Health Officer of the City of Racine, Wisconsin, Dr. W. W. Bauer used the *Appraisal Form* of the American Public Health Association in 1926 as he had done during the previous year. This enables him to tabulate a comparison of activities for the two years and has resulted in a healthy increase of his total score from 673 to 723.4 points. Following the presentation of his scores, Dr. Bauer draws his conclusions and bases his recommendations upon a study of the figures which appear in the *Appraisal Form*.

The Detroit Health Department has just issued in *City Health* for February, 1927, an appraisal of health work in that city for the past six years. For 1921 the appraisal value assigned is 721 points, and in 1926 this has increased to 827 points. The report gives the details for each of the six years. Following the summary there is a comparison between the value assigned to each activity and the amount of money spent for preventive medicine in Detroit in the years 1921 and 1926. There is a surprisingly impressive correlation between the two sets of figures.

It is hoped that many health departments will continue to evaluate their work in terms of the *Appraisal Form* so that others may gain

by experience, and so that constructive criticism may be accumulated which will prove of service when the *Appraisal Form* is again adjusted. The Detroit report contains a great many recommendations which have been formulated with the view of assisting in a restudy of the *Appraisal Form*.

Vaccination and Syphilis—In the March 4, 1927, issue of *Public Health Reports* there appears a statement entitled "Syphilis not Caused by Vaccination" which is signed by M. W. Ireland, Surgeon General, United States Army; E. R. Stitt, Surgeon General, U. S. Navy, and H. S. Cumming, Surgeon General, United States Public Health Service. This statement, which is made to counteract propaganda which is being circulated to the effect that vaccination against smallpox may cause syphilis, should prove a very valuable reference to the health administrator who is confronted with local agitation of this character. The report emphasizes the fact that "syphilis is a disease confined in nature to the human species alone, and as soon as the use of calf vaccine instead of human vaccine became universal, the possibility of transferring syphilis by vaccine was entirely done away with." During the past ten years there have been 10,568,748 vaccinations recorded by the government medical services, and in no instance has a report been received to the effect that an individual claims to have contracted syphilis as a result of vaccination.

"There has never been reported anywhere a case of syphilis attributable to vaccination following the use of bovine smallpox vaccine."

LABORATORY

C. C. YOUNG

BRILLIANT GREEN BILE CULTURES IN 126 CASES OF TYPHOID FEVER

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THERE is great lack of uniformity in procedures used for the collection of material, and the subsequent isolation and identification of *B. typhosus*. Almost every worker uses different methods or modifications, indicating that none is entirely satisfactory.

COLLECTION OF MATERIAL

The prevention of the rapid diminution of typhoid bacilli in specimens of feces has engaged the attention of many laboratories. Much of the material collected for study is necessarily located at considerable distances and means to insure a dependable examination in spite of this delay constitutes a problem of the first importance. The ideal method would be a selective medium which would inhibit the normal fecal bacteria, and yet permit *B. typhosus* to multiply. A brilliant green bile has been devised which in considerable degree meets these requirements. This medium has already been described[1] but certain modifications have been made which increase its usefulness.

PREPARATION OF THE MEDIUM

The basis of the medium is bile. Dehydrated bile (Difco) is satisfactory and in our experience is more uniform, especially in its reaction, than slaughterhouse bile. An amount, sufficient to last several weeks is prepared at a time, autoclaved, and stored in the cold room.

PREPARATION OF THE DYE

When the method was first put into use, several years ago, the brilliant green then obtainable was quite uniform and different lots gave consistent results. The activity of this dye is greatly diminished in bile, but it was found that with the product then obtainable a concentration of 1:1500 was satisfactory. It was soon found, however, that this uniformity no longer existed and at the same time the specific inhibitory action of many brands of the dye on *B. coli*, in bile, was reduced to a point where *B. typhosus* in feces could not be isolated. Numerous attempts were made to improve the selective action in bile. The fol-

lowing treatment was found to accomplish this result:

A 5 per cent solution of the dye in N/1 hydrochloric acid is evaporated to about 1/20 its volume, over a boiling water bath. The evaporated dye is diluted with distilled water to make a 5 per cent solution and kept for use. When the dye is dissolved in the acid a color change takes place—yellow or burnt orange—but the final color is again green.

The stock solution after the acid treatment keeps indefinitely. It may be used at once but it seems to improve on standing so that the inhibition of *B. coli* is more complete after the solution has aged or ripened for two or three weeks.

TITRATION

It cannot be emphasized too strongly that the success of the method hinges upon the proper concentration of brilliant green in each batch of bile. This is determined by setting up a series of one ounce wide-mouth bottles, each containing 15 c.c. of bile. To these is added brilliant green from the stock solution in sufficient quantities to make a series of dilutions from 1:100 to 1:500, or higher, with 20–25 per cent intervals between the dilutions. The bottles are corked and sterilized in the autoclave. When cool, to each bottle is added ½ g. of feces and a moderate inoculation of typhoid bacilli. It is advisable to set up two or three such series using different samples of feces, since some feces contain organisms not readily inhibited by the dye and consequently do not give a clear cut titration.

The bottles are allowed to stand at room temperature for 24 hours and a plate (see Identification) streaked with a loopful from the surface of each bottle, without agitation of the contents. The plating is repeated on the two succeeding days making a total of three platings from each specimen. It is usually found that the first plates show very few colonies in the stronger concentrations while the plates from the weaker dilutions show a moderate growth of fecal bacteria with scattered colonies of typhoid. On the succeeding days the proper concentration of the dye can be determined, as the results become more clear cut. A typical titration yields on the third day's platings, one or two plates (usually around 1:250 with the batch of dye now in use) which show a large number of typhoid colonies, with only a moderate number of colonies of *B. coli* and other fecal bacteria. That concentration of dye then which causes the greatest inhibition of fecal flora and at the same time gives the largest yield of typhoid colonies, is added to the batch of bile for use. This is dispensed into bottles, 15 c.c. to a bottle. These are corked and sterilized in the autoclave.

COLLECTION OF THE SPECIMEN

The brilliant green bile is used for blood, feces and urine cultures. A one-ounce wide-mouth bottle with a good grade cork stopper has been found to be a convenient and economical container.

Blood—10 c.c. is the best amount for the most satisfactory results. This amount of blood has a sufficient absorptive effect on the dye so that no inhibition of the growth of the typhoid bacillus occurs.

Urine—10–15 c.c. is used. Urine cultures in brilliant green bile frequently yield a prolific growth of *B. typhosus* in pure culture.

Feces—A maximum of 1 g. is sufficient. Larger amounts than this are usually unsatisfactory, owing to the absorptive action of the feces on the dye with resulting overgrowth of *B. coli*. It is highly important in the use of this method that those responsible for the collection of fecal specimens impress upon each individual that he put only a small quantity in the bottle. When this is thoroughly impressed upon the person submitting the specimen satisfactory results are insured. When care has not been used, the bottle usually is filled with feces and the examination is useless.

ISOLATION AND IDENTIFICATION

We have found brilliant green Endo agar a very satisfactory medium for the initial plating. Good differentiation between lactose and non-lactose fermenters is obtained, and if stored in the dark and cold will keep for at least a month, so that titration for the dye content need not be too frequently made. The concentration of brilliant green for Endo agar is determined as for brilliant green agar.[2] Three or four flasks containing 50 c.c. of the agar are melted and to these are added concentrations of brilliant green covering the range within which experience has shown the proper dilution will lie. We have found that this usually falls between 1:250,000 and 1:500,000 with the dye in use at present. A heavy suspension of feces is prepared and fairly heavily seeded with typhoid bacilli (1 loop to 2 or 3 c.c. of suspension). The plates are then streaked with a loopful of the suspension and that con-

centration chosen which gives the most complete inhibition of fecal bacteria and at the same time no marked inhibition of *B. typhosus*, as evidenced by the number and the size of the colonies.

The specimens received in brilliant green bile, then, are plated on the day of arrival, and on the two succeeding days, on brilliant green Endo agar, one loopful from the surface of each bottle being used, without agitation of the contents, the bottles being left at room temperature in the meantime.

The purpose of the three successive platings is to permit multiplication of original small numbers of typhoid bacilli to a point where they may be detected on a plate streaked with one loopful of the culture. This frequently occurs not only with blood and urine cultures but with feces cultures, and is responsible for a considerable number of positive results which would be missed by one direct streaking of the fresh specimen.

A macroscopic slide agglutination test is made on characteristic colonies from the plates. This gives preliminary evidence of the nature of the organism. If the colony is typical and the performance of the particular serum and the dilution of it used, are known by constant daily experience with it, cultures from clinical cases may be immediately reported on the basis of this test. This facilitates prompt reporting, a desideratum of some importance to most laboratories. Our experience has been that this test, if conservatively used, is invariably confirmed by the subsequent fermentation and agglutination tests.

Regardless of the results of the slide agglutination, suspicious colonies are picked to Russel double sugar tubes.

Cultures giving the characteristic appearance of typhoid or paratyphoid on this medium are then restreaked on Endo plates. This step gives valuable information regarding the characteristics of the colonies in pure culture, and insures its purity. Representative colonies from this plate are picked again to Russel tubes and from this a plain agar slant is inoculated and a macroscopic tube agglutination made.

At the same time fermentation tests are made on the following carbohydrates: adonite, mannite, rhamnose, saccharose and sorbite. *B. typhosus* produces acid from mannite and sorbite, *B. paratyphosus A* acid and gas from mannite and sorbite and acid only from rhamnose; *B. paratyphosus B* both acid and gas from mannite, rhamnose and sorbite. Some strains ferment sorbite more slowly than others, but all have been found to produce acid within 72 hours. Adonite and saccharose are included to detect those colon-like organisms which ferment lactose feebly or not at all and which are frequently encountered when brilliant green media are used. Some of these carbohydrates are rather expensive, particularly when used in considerable quantities. In the interests of economy a small fermentation tube (8 x 15 mm.) can be used in a tube 12 x 100 mm. containing 2 c.c. of broth.

We have not encountered any bacteria which meet these cultural requirements which have not proved to belong to the typhoid group. If a strain is isolated which gives these cultural reactions but which does not agglutinate with typhoid serum it is subcultured daily on plain agar slants. Usually six to eight such transfers are sufficient to render it agglutinable. In our experience about 1 in 50 to 100 strains are inagglutinable, when freshly isolated.

RESULTS FROM CLINICAL CASES

A state laboratory works under the handicap of lack of contact with the clinical sources of the material which it is called upon to examine. We have, however, records of 126 cases of clinical typhoid fever, which were visited by a representative of the State Board of Health. From these a single set of specimens was obtained at random stages of the disease. In some instances, only a single specimen (blood, feces or urine) was obtained, in others, blood and feces, or blood, feces and urine, at the same time, were received. Examinations were not repeated in any of these cases, owing to their inaccessibility. Doubtless, better results would have been obtained had it been possible to procure additional specimens, but the results (Table I) show what may be expected from a single visit. All of the specimens were at least 24 hours old at the time of examination.

Positive results from one or more of the specimens submitted were obtained in 105 of the 126 cases, or 83 per cent. In 59 cases, a blood culture was obtained, the earliest on the 5th day, the latest on the 31st day. Twenty-nine were positive. Of the 30 which were negative, 9 were taken after the 14th day. The latest positive blood culture in this series, excluding relapses, was the 22nd day.

In 108 cases a single specimen of feces, obtained between the 3rd and 48th days of the disease, yielded 86 positive cultures, or 80 per cent. The high percentage of positive feces

TABLE I

RESULTS OBTAINED WITH BRILLIANT GREEN BILE CULTURES IN 227 EXAMINATIONS FROM 126 CASES OF TYPHOID FEVER

Kind of Specimen	1st Week		2nd Week		3rd Week		4th Week and After		Total		
	No. Exam.	No. Pos.	No. Exam.	No. Pos.	No. Exam.	No. Pos.	No. Exam.	No. Pos.	No. Exam.	No. Pos.	Per cent Pos.
Blood	18	13	27	12	9	2	5	2	59	29	49
Feces	21	14	49	38	19	15	19	19	108	86	80
Urine	10	6	32	11	11	1	7	2	60	20	33

cultures during the first week is striking. Seven positive specimens were obtained as early as the 3rd and 4th days.

The results indicate that typhoid bacilli frequently appear in the feces early in the disease. This early appearance in the intestinal discharges has, of course, been previously noted and the so-called precocious carriers of Sacquépée[3] excrete the bacilli before the appearance of symptoms. This small number of observations suggests that this early excretion is not, perhaps, so uncommon as has been generally supposed.

It is difficult to exactly locate the onset of an insidious disease like typhoid and consequently the exact stage cannot always be definitely stated. However this may be, the number of positive feces cultures obtained during the early days of the disease, together with the fact that 80 per cent of the cases gave positive results with a single specimen, illustrates the value of this method of confirming the diagnosis.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

The Tuberculosis Death Rate 1900–1925—The Division of Vital Statistics of the Bureau of the Census has recently issued extremely interesting statistics on tuberculosis. The adjusted death rate for males from tuberculosis (all forms) has declined from 194.4 per 100,000 in 1900 to 89.7 in 1924—a reduction of 104.7 per 100,000. The adjusted death rate for females declined from 182.8 in 1900 to 77.2 in 1924 or 105.6 per 100,000, practically the same for males. Relatively, however, the decline for females was somewhat greater. The female death rate slightly exceeded the male rate at ages 5–9, but it was nearly 50 per cent higher at ages 10–14, and nearly twice as high at ages 15–19. The differences are less pronounced for the 20 years following. At ages 30 years and over, female mortality from tuberculosis is decidedly less.

Differences in the mortality for this country and England and Wales are almost unbelievable. At ages 1–4, death for males are 37 per 100,000 against 104 for England and Wales. At ages 5–9, the rate is 13 per 100,000 against 36 for England and Wales. For the age period 25–29, the male death rate was 131 per 100,000 in the United States against 150 for England and Wales. The facts of this situation cannot, however, be fully understood without an extended study of non-tubercular respiratory diseases.

A table of 109 American cities for 1925 brought out some exceedingly striking elements. The highest death rate for pulmonary tuberculosis is given for El Paso, Texas, 392.6 per 100,000 due to the fact that this city is a health resort and also has a large settlement of Mexicans who are very susceptible to this disease. The next highest rate is 213.6 for San Antonio where similar conditions exist. Next in order is 171.6 for Denver, Col., and then 163.6 for New Orleans, La., where there is a large negro population, among which the death rate from pulmonary tuberculosis is about twice the normal rate of the white population.

Other cities with other excessive rates or rates over 100 per 100,000 are Sacramento, Cal., Petersburg, Va., Nashville and Mem-

phis, Tenn., Macon, Ga., Los Angeles, Cal., Houston, Tex., Covington, Ky., Brockton and Boston, Mass., and Albany, N. Y. All these rates are influenced by special conditions, particularly the racial factor of the population or the migratory effect of other elements, which are obscure and not easily ascertainable.

Excessively low rates such as given for Lansing, Michigan, 19.9; for Lynn, Mass., 22.3, and for McKeesport, Pa., 26.5; are suggestive of further inquiry and study before justifying definite and final conclusions. The present tabulation emphasizes the immense range of the local pulmonary tuberculosis death rate, namely from 19.9 to 392.6 and demands the attention of public health officers and sanitarians.—Frederick L. Hoffman, *Spectator*, 117:21–28 (Nov. 11), 1926.

Stillbirths and Neonatal Deaths in Woonsocket, R. I. in 1925—Among 1,444 infants born in 1925 in Woonsocket, 55 neonatal deaths occurred. The neonatal death rate was 38.08 per 1,000 live births. The 44 stillbirths that occurred in the same year were at a rate of 30.47. Neonatal deaths formed 43.4 per cent of the total infant deaths and the stillbirths formed 34.09 per cent of the total deaths. Of the neonatal deaths 38.2 per cent were due to prematurity and 14.5 were caused by congenital debility. A large number of deaths due to prematurity were among infants of foreign-born mothers.

Eighty-five and four tenths per cent of infant deaths were children of native mothers of foreign or mixed parentage and of foreign-born mothers. Ten and nine tenths per cent of the deaths occurred within 15 minutes after birth. As the age at death increased, deaths among infants of native mothers decreased, and of foreign mothers increased. Two mothers of babies included in this study died at childbirth.

Twenty-five and four tenths per cent of the mothers of infants living less than 1 month were gainfully employed during pregnancy and 27.2 per cent of mothers having stillbirths. Over one-half of the neonatal deaths and stillbirths were to mothers receiving no help with their usual household duties during pregnancy. About 32 per cent of all these deaths were the results of first pregnancies.

Thirty-three mothers received no prenatal instruction, 61 received advice from their physician only, 1 mother had advice from a physician and nurse. Only 1 mother had read literature on prenatal care.

Sixty-seven neonatal deaths and stillbirths were preceded by a previous confinement. One neonatal death out of 5 came within an interval of 15 months after its predecessor. As the interval from the preceding confinement increased, the number of stillbirths also increased.

The number of male neonatal deaths and stillbirths was considerably in excess of the number of female, the figures being 56 and 43 respectively.

More neonatal and stillbirths occurred in the lowest earning group ($20–$30). The deaths and stillbirths in this income group were almost evenly distributed between native and foreign-born mothers.—Sarah I. Morse, *Stillbirths and Neonatal Deaths in Woonsocket, 1925.*

Alcoholic Arrests and Deaths since 1920—Although many diverse opinions have been expressed concerning the effects of the Eighteenth Amendment and the Volstead Act, they have chiefly been the conclusions of propagandist organizations with a definite prejudice favorable or strongly opposed to them. The author, attempting an analysis of the situation, has made a study of the number of arrests for drunkenness, and the number of deaths due to alcoholism and cirrhosis of the liver in New York State. New York was chosen because it is the most populous state in the Union and the evidence about it is more abundant and recent. In order to meet the objection that New York does not afford a fair test because state sentiment and legislation do not support the federal policy as well as other states, the inquiry was extended to the rest of the country.

From figures compiled from 22 cities in New York State with a population of more than 25,000 there was seen to be a steady drop in number of arrests after 1917 to a minimum in 1920 when the Amendment and Volstead Act became effective. After 1920 the increase in number of arrests was almost as rapid as the previous drop, with an average increase of about 118 per cent from the low point of 1920 to 1924. In 27 cities of the state with a population between 5,000 and 25,000 the drop in arrests between 1917 and 1920 was more rapid than in the larger cities, going down to about one-fourth, but

in the following 4 years it nearly trebled. Similar studies of Massachusetts and of 128 cities in 38 other state show a high point in arrests for drunkenness in 1916 or 1917, a low point in 1920 and an increase after 1920, at first very rapid then slackening as if stabilization at approximately the 1914 number is at hand.

There has been a steady increase in deaths from alcoholism and cirrhosis of the liver in New York since 1920 with deaths from alcoholism more common, from cirrhosis of the liver less common than in 1920. In the country at large, the deaths from alcoholism have increased in 4 years between three-and-four-fold; the deaths from cirrhosis of the liver have little more than kept pace with the increase of population.—Walter F. Willcox, *J. Am. Statist. Assn.*, 21:458–465 (Dec.), 1926.

Epidemic **Meningitis and Its Sequelae**—Apparently most people have a natural immunity to epidemic meningitis but males seem to be more susceptible to it than females. In a study of meningeal conditions in New York for 16 years, there was a preponderance of males, nearly in the ratio of 3:2, suffering from the disease. It was also found to be most prevalent in the first six months of the year and to be largely a disease of infancy and early childhood, being especially fatal in early infancy.

The mortality for the 627 cases which occurred during the period of the study was nearly 30 per cent, but this unusually high rate was due to the large percentage of children under one year of age, the delay in consulting the doctors and complications caused by infection from other diseases. Three hundred and thirty-seven of the cases were followed up and about 82 per cent found to have made complete recovery, 18 per cent showed sequelae, often of a serious nature. These defects for the most part develop during the acute stage of the disease and are the direct and immediate result of the inflammatory process. The most important and frequent of the sequelae is deafness, which made up 42.6 per cent of the total of the 61 cases showing sequelae; paralysis of different types, 18.0 per cent; mental disturbances 13.1 per cent; defects of vision 11.5 per cent; speech defects 3.3 per cent.—Josephine B. Neal, Henry W. Jackson and Emanuel Appelbaum, *J. A. M. A.*, 87:1992–1995 (Dec. 11), 1926.

Fetal Mortality—The Special Report Series No. 109 of the Medical Research Council gives the results of a clinical and pathological study of 1673 dead births and neonatal deaths, carried on in London, Glasgow, Liverpool, Edinburgh and Cardiff. The authors feel that maternal morbidity is closely related to fetal and maternal mortality, and their results show that not less than 25 per cent, and probably more, of all dead births are due to manipulations. Adequate antenatal supervision is the only means of prevention, or of lessening these deaths.

"Complications of labor" was the most prevalent cause of death, ranging from 22.4 to 37.1 per cent. In London, antepartum hemorrhage followed close behind with 22.3 per cent, but the other series rate it much lower and give a high place to maternal diseases and placental states. Syphilis is generally given third place, then come "toxemias of pregnancy" and the "fetal states." Syphilis, toxemias of pregnancy and antepartum hemorrhage were found to account for a very large proportion of macerated fetuses; infections played a large part in the neonatal deaths, killing no fewer than 88 out of 97 cases. In over half the cases there was some associated maternal condition or complication.

The percentage of dead births in cases of certain maternal syphilis was 28.6; in possible syphilis, 59.1. One-third of the records gave no urine analysis in toxemia; in the remaining two-thirds, albumin was present in all but one of the eclamptics and in all but 2 of the cases of albuminuria of pregnancy. Bleeding from the placental site during pregnancy caused 251 deaths, 122 being cases of placenta praevia none of which were due to syphilis. The proportion of intracranial tears was high in the 900 non-macerated and non-deformed children, amounting to one-quarter of the cases; the greater number occurred in breeches and persistent occipito-posteriors and in cases connected with complications of labor and syphilis. Contracted pelvis accounted for 175 deaths, many of which could have been saved by proper antenatal care. There were 142 abnormal presentations and 58 difficult or prolonged labors, half of them in primiparae. Prolapse, coiling or knotting of the cord appeared as primary cause of 41 deaths. One hundred and thirty-eight cases were due to fetal deformity and prematurity; 40 per cent were full term but in 47 instances

there was no apparent cause of death other than prematurity.—Special Report Series No. 109. Eardley L. Holland and Janet E. Lane-Claypon; ab., *Lancet*, 211:1337–1338 (Dec. 25), 1926.

Mortality in Appendicitis—The death rate as a result of diseased appendix is increasing at the present time due, perhaps, to the casual attitude of the public towards appendicitis, ulcer and gall bladder trouble, and the readiness of the poorly trained operator to deal with these conditions. The average mortality of appendicitis is reported from various sources as varying from 2.9 per cent to 8 per cent, rising as high as 16 per cent for perforated cases alone. Only 9 hospitals out of 34 reported in one study had a mortality of 3 per cent or less.

The authors believe that the treatment before and after the operation is of prime importance in all cases of appendicitis. So strong is their opinion in this respect that they admit a temptation to regard the skill of the surgeon as a secondary consideration once the definite diagnosis has been established. A uniform technic developed by the authors for their hospital has been in use for more than 2 years with an average mortality rate of 1.22 for appendicitis operations.—A. E. Archer and M. A. R. Young, *Canad. Med. J.*, 16:1491–1494 (Dec.), 1926.

Northern Ireland. Vital Statistics—The Annual Report of the Registrar-General for Northern Ireland for 1925 estimated the population at 1,257,000 including military. The marriage, birth, and death rates were all below the average for the previous ten years.

The number of births registered was 27,886, the rate being 22.0 per 1,000 which is 0.7 below the rate for 1924 and 0.9 below the average rate for 1915–1924. Since the year 1920 in which the exceptionally high rate of 25.9 was recorded, the trend of the birth-rate has been in a downward direction.

The deaths numbered 19,784, giving a rate of 15.7 per 1,000. This rate, 0.4 below the rate for 1924, and 1.4 below the average for the previous ten years, is mainly due to an appreciably lower number of deaths from tuberculosis and the respiratory diseases which is only partially offset by the higher number of deaths from cancer and whooping cough. Between 1918 and 1923, a rapid decline in the general death rate took place, reaching 14.9 in 1923, but rising in 1924, was in 1925 higher than in 1923.

There were 2,100 tuberculosis deaths with a rate of 167 per 100,000 as compared with 163 in 1924. The tuberculosis death rate declined steadily from 254 in 1918 to 162 in 1923 but is now indicating a slight upward tendency. Deaths from cancer and malignant disease numbered 1,441 which is the highest number for the years 1915–1924. The cancer death rate was 115 per 100,000 population as compared with 134 for England and Wales, 136 for Scotland and 94 for the Irish Free State. Bronchitis and pneumonia deaths numbered 2,660 which figure is 249 less than that for 1924 and 567 less than for the average annual number for the years 1915–1924.—Annual Report of the Registrar-General for Northern Ireland 1925, ab., *Med. Off.*, 36:280 (Dec. 18), 1926.

The Health of Scotland—The seventy-first annual report of the Registrar-General for Scotland for the year 1925 estimates the population for Scotland in the middle of 1925 at 4,893,032. This is an increase of 11,395 over the previous year, although there was an excess of emigrants from Scotland over immigrants to Scotland of 28,430. There were 104,137 registered births for the year as against 106,900 of the previous year; the birth rate for 1925 of 21.28 per 1,000 was the lowest since 1858 except for 1917 and 1918. There were 65,507 deaths registered in 1925 with an annual death rate of 13.39 per 1,000 which is 1.02 less than that of the previous year; this is the smallest number of deaths since 1861 with the exception of 1923. Of the total deaths, 21.7 per cent were of children under five years of age; the infantile mortality rate for 1925 was 90.6 per 1,000 registered births which was 7.1 less than that of the previous year, 8.7 less than the mean of the preceding 10 years, and lower than all previous years with the exception of 1921 and 1923.

The most prevalent causes of death were: malignant disease, 6,675 deaths with a death rate of 136 per 100,000, which is 862 more than the mean of the preceding 10 years; tuberculosis 5,390, the smallest number of deaths yet recorded for this disease in Scotland—3,734 of these were due to tuberculosis of the respiratory system; pneumonia, 5,821, which is 1,870 less than the number of deaths for the previous year; influenza, 1,246, which

is 1,244 less than for 1924; whooping cough, 1,737, which is 112 more than for the previous year; diphtheria, 505, or 63 more than for the previous year; scarlet fever, 404, as against 410 deaths of 1924; measles, 512 deaths as against 1,592 of the previous year; syphilis, 114; diabetes, 457; encephalitis lethargica, 154; cerebro-spinal meningitis, 83; infantile paralysis, 21; enteric fever, 52; typhus fever, 4. There have been no deaths from smallpox since 1921 although, since the passage of the Vaccination Act of 1917 making conscientious objection of parents a valid reason for avoiding statutory vaccination, there has been a gradual annual fall in the number vaccinated, with the exception of 1920 when, with an epidemic of smallpox in Glasgow, the percentage rose temporarily to 70.54.—Report of Registrar General, *Brit. M. J.*, 2:848-849 (Nov. 6), 1926.

Epidemic of Encephalitis in Sheffield—After a study of the outbreak of encephalitis in Sheffield in 1924 the investigators were unable to establish any relation between the disease and social conditions such as overcrowding, poverty or insanitary housing, nor with site, water, milk or food supply. There was no trustworthy evidence that it is spread by direct contact nor any data for computing an incubation period. The only positive evidence disclosed concerns the greater liability to infection in males and the greater liability to death from the disease in females.

Although about half the cases could be described as mild with a tendency toward complete recovery, Parkinsonism was frequently found to follow a very mild case. The time of onset of Parkinsonism was most commonly from 6 to 12 months, the facial mask appearing early. Five of the 64 cases so afflicted have died, while a considerable percentage of the remainder is steadily growing worse. Ocular palsies persisted rarely. An occasional speech difficulty remained for considerable periods. Mental disorders persisted in half the cases in which they were acute in the primary attack. Respiratory disorders did not persist in any case. The occurrence of moral changes was too difficult to assess to afford material for report. Of the 43 patients who did not survive, 40 died within 2 months of the onset of the disease.—Special report Series No. 108. Medical Research Council; *Lancet*, 2:1123-1124 (Nov. 27), 1926.

Diabetes in Children—The child with diabetes is the pure diabetic patient and deserves intensive study because of the light he throws on the problems of treatment, prognosis, regeneration of the pancreas, the so-called diabetic complications of the eyes and arteries and of the diabetic causes of death.

More than half of 395 diabetic children treated by the author since 1898 are known to be alive. The duration of 8 cases, 3 dead and 5 living, has exceeded 10 years. Of 52 cases, now living, first treated in the Allen epoch, it is 6.6 years. Of 61 cases, first seen in the Naunyn epoch, from 1898 to 1914, only 1.6 per cent are still living. Of 169 cases, first seen in the Allen epoch from 1914 to 1922, 30.8 per cent are still living. Of 165 of the Banting epoch, 1922 to 1926, 89.1 per cent are still alive.

A survey made by Angeline D. Hamblen of the deaths from diabetes in Massachusetts between 1920 and 1925, shows a steady rise in the percentage of total deaths from diabetes above 50, and a fall in the percentage under 20 since 1910 becoming more rapid since 1922. Instead of 11 per cent of the deaths in 1900 and 10 per cent in 1910 falling below 20 years of age, the percentage is now 3.

Nearly all the long lived diabetic children in the literature inherited the disease, but the author believes that boys may marry at 21 years or over while the girls should have diabetes 10 years before they assume so much responsibility. Diabetes was found to be more unusual among Jewish than Gentile children.—Elliott P. Joslin, *J. A. M. A.*, 88: 28-31 (Jan. 1), 1927.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

Report of Committee on Transportation of Milk and Milk Products—Some of the conditions in handling milk causing economic losses which were brought to the attention of the President's Agricultural Committee by Secretary Hoover are outlined. The changes in methods of transporting milk in recent years with an explanation of the extent of these changes are thoroughly explained. Insulated glass enamel lined metal tanks in insulated cars are used for bulk shipments. Tanks are mounted on special cradles and anchored to the needle beam of the car. This means of transportation can only be used where a railroad siding is available. The unit tank system was tried by railroads hauling milk to New York City but it failed because of insufficient equipment to handle the weight.

Motor truck tanks and trailers are a recent development, and up to January 1, 1925, about 230 metal tanks were in use. To avoid overweight on roads in some states semitrailers or trailers are used.

Refrigerator trucks are the latest means of hauling milk from receiving stations to the city plants. Condenser coils, compressor and compressor motor drive are located on top of the refrigerator body.

A committee of the U. S. Chamber of Commerce studied the motor transportation situation and in their conclusions recommended coöperation among transportation agencies at points where further expansion would be possible. Short hauls by organized motor transports will reduce yard congestion and release cars for line hauls. Further development of technical equipment and public regulation of all common carriers will be necessary to insure good service.

The great improvement in transportation directs special attention to the efforts which are being made by some to reach perfection in the sanitary production, handling and transportation of milk and milk products.—Russell S. Smith, Internat. Assn. Dairy & Milk Inspectors *Fourteenth Ann. Rep.*, Oct. 12, 14, 1925, pp. 135–150. Abstr. by W. W. White.

Report of Committee on Methods of Delivering Milk in Some European Cities—This article, with illustrations, shows the laborious and antiquated way milk is handled in Italy, Switzerland, France and England. Cows are driven through the streets of Italy and milked at the consumer's door. Dog carts are used in Switzerland for delivery or the milk is carried in cans on the back of the distributor. In Paris, wagons are used and milk is delivered in bottles similar to our soda water bottles. In Holland, milk carts are pulled both by men and dogs. In England, many up-to-date plants were seen by the investigator but the milk was delivered on small push carts.

One sanitary dairy visited in Belgium was of special interest. Only attendants were allowed access to the stables which were finished in white tile. Each cow stood on a cocoa mat 2" thick which was thoroughly cleansed every day. The milk produced was immediately bottled, hermetically sealed and heated to 180° F. and held from 20 to 30 minutes. After cooling in cold water it was shipped to the Belgian Congo twice each month.

Paris and London were the only cities where laboratory control of the milk supply was practiced.—Prof. W. A. Stocking, Internat. Assn. Dairy & Milk Inspectors *Fourteenth Ann. Rep.*, Oct. 12, 14, 1925, p. 248. Abstr. by W. W. White.

Mice and Bubonic Plague in Australia—While the house mouse, Mus musculus, has been found under laboratory conditions to show a relatively high susceptibility to infection with *Bacillus pestis*, the rather limited investigations conducted to establish a possible relation of mice to bubonic plague have resulted negatively. The writer, however, feels that due to the swarms of mice spreading widely across the countryside at recurrent periods, and particularly following in the wake of the harvesting of a successful wheat crop, the relationship of the mouse to bubonic plague, and possibly to other diseases of man, merits further investigation.

Reference is made to the findings of several research workers who have conducted investigations along the line of mouse transmission of plague.—Dr. F. McCallum, *Health of the Commonwealth of Australia*, 3:175 (Nov.), 1925. Abstr. by H. N. Old.

Coastal **Mosquitoes and Their Control**—This paper consists of two parts, an illustrated lecture on mosquitoes, and a general statement of methods employed in the control of a salt marsh mosquito. Ochlerotatus detritus, in and around Hayling, Hampshire, England. The author claims that prior to the year 1920, when this work was organized, no attempt whatever had been made to deal with mosquito pests in Great Britain. At the time this work was undertaken the mosquito nuisance had become intolerable to the inhabitants of Hayling. Breeding places of Ochlerotatus detritus were located in nearby salt marshes, popular support of the control program was secured and extensive drainage operations were undertaken with the result of a complete disappearance of the mosquito pest at the end of a 4-year control campaign.

The flight range of Ochlerotatus detritus was observed to extend a distance of nearly 3 miles, and the eggs of this mosquito were found to retain their vitality out of water for at least one year. On being flooded with salt water these eggs would hatch within a few hours.—John F. Marshall. Read before the Zoölogy Section of the British Assn. for the Advancement of Science, Southampton Meeting, Aug. 27, 1925. Abstr. by L. D. Fricks.

Cholera at **Goalundo Ghat**—The article deals principally with the successful treatment of 24 cases of cholera admitted to the hospital. Goalundo is located on the Padma River below the confluence of the Ganges and Brahmaputra Rivers, 155 miles by rail from Calcutta. It is a transfer place for railway and river services. The elevation is 24.5 feet above sea level and at the time of the outbreak, September, 1925, the river level was 26.5 and the entire area was flooded. Temporary buildings and huts are built on mounds, or have temporary platforms within as a provision against high water.

The first case was admitted to the hospital on September 19. At that time no cases were known to exist. River water was implicated, as it was known to be used more or less generally. Other vectors were largely eliminated, due to the flooded condition.

Investigation showed that a large number of small fishing boats took refuge during a storm on September 14 and 15 in a shallow area protected by embankments and a bazaar and that on at least 2 of these boats the crew were attacked with profuse diarrhea and vomiting. Following the storm they sailed for home (unknown), without applying for relief. The first cases occurred in the area surrounding the sheltered area referred to. It was assumed that the illness on board the fishing boats was cholera.—W. J. Marshall, *Indian Med. Gazette*, 61:4 (Jan.), 1926. Abstr. by R. E. Tarbett.

Sodium Aluminate as a Coagulant—A brief description of experiment at Badin, N. C., with sodium aluminate ($Na_2Al_2O_4$) as a coagulant is given. This alkaline substance, which contains approximately 50 per cent soluble alumina (Al_2O_3) was used in conjunction with (1) filter alum, (2) sulphuric acid and (3) nitre cake. Slightly better coagulation was given by (1) than by the soda alum process. The discussion indicated that because somewhat less CO_2 is produced corrosion might be decreased but that in general no great economy would be effected.—H. A. Lilly, *J. N. C. Section, Amer. Water Works Assn.*, 3:16 (1925). Abstr. by J. K. Hoskins.

Fundamentals in the Purification of Creamery Wastes—This bulletin explains that no one has yet devised a successful method for purifying creamery wastes, but engineers in such states as Iowa, Wisconsin, Minnesota, Michigan and New York are considerably interested in the problem.

Differences of opinion exist as to the efficiency of septic tanks in creamery-waste purification. Where there is only a relatively small amount of creamery waste in a large volume of sewage, there will probably be no difficulty in its treatment; but if the proportion of creamery waste is relatively large, it will cause trouble at the treatment plant because of the presence of sugar, which is practically absent in ordinary sewage. When the sugar content reaches a certain concentration, the ordinary septic tank will not work efficiently.

Briefly stated, the effects of the sugar content of creamery waste on bacterial action in septic tanks are (1) The sugar is rapidly decomposed with the liberation of acid, which curdles the waste. The curd then either precipitates out or rises to the surface as a scum; (2) if the creamery waste is sufficiently concentrated,

enough acid develops to kill most of the bacteria in the waste; (3) the decomposition of the nitrogenous (protein) materials is decidedly interfered with or completely stopped.

Protein decomposition results in the liberation of ammonia, while sugar decomposition yields considerable acid. There are always mixtures of bacteria acting in septic tanks. The sugar-decomposing organisms will quickly generate acids which destroy or retard the development of the protein-digesting bacteria. As small a quantity of sugar as one part in a thousand has been found sufficient to prevent the decomposition of protein. The problem of creamery-waste treatment is to ascertain the conditions necessary for the decomposition of sugar by bacteria without the development of appreciable quantities of acid. *Eng. News-Rec.*, 96:898 (June 3), 1926. Abstr. by W. R. Avrett.

Disinfestation of Houses by Fumigation with Cresol—The method of disinfestation of houses for plague in the Punjab since 1915, is by vaporizing commercial cresol on smouldering cow dung cakes.

In a room of 1,000 to 1,500 cubic feet capacity, 10 ounces of cresol vaporized in 2 iron pans of smouldering dung will make the fleas leave the rats but will not harm the rats themselves. The room should be sealed tightly and remain closed for 4 hours. The floors should be washed down with phenyl lotion. Rat runs should be fumigated with neem-cartridges. The effect of the cresol is more pronounced a few feet above the floor than at the floor level.—R. B. Lal and M. D. Tiwari, *Indian Med. Gazette*, 60:255 (June), 1925. Abstr. by L. M. Fisher.

The Biology of Jersey Water Works—Further data derived from microscopical examinations of Jersey water supplies are given. Contrary to the reports of most observers that Asterionella in numbers exceeding 2,000 per c.c. gives rise to a geranium or fishy odor, numbers as high as 31,184 per c.c. were recorded without perceptible taste or odor. It is suggested that absence of taste and odor may be due to high chloride content of water, which is normally 7.5 parts per 100,000. Asterionella was the dominant organism, and during one period it became so prevalent that filtration was interfered with, necessitating the application of copper sulphate. The spraying method of applying the latter has been found most satisfactory. Temperature does not appear to be the determining factor in the increase of diatoms, which frequently follows an increase in flow of soil water. During the period under review the numbers of green algae present were comparatively low and very few Daphnia appeared. This had a remarkable effect on the trout fry reared in the filter beds, the maximum length attained being about 4 inches compared with 8–9 inches when Coelastrum is present in numbers of 4,000–5,000 per c.c., and Daphnia are plentiful. These results are in agreement with observations at the spawning beds at Port Erin.—W. Rushton and P. A. Aubin, *Surv.*, 68:557 (Dec. 18), 1925. Abstr. by C. G. Gillespie.

Refuse Disposal Practice in Six British Municipalities—This article is a description of the processes of handling the refuse of five different British cities in destructor plants and land reclamation in the sixth. The trend has been to handle everything mechanically to reduce labor costs. Such mechanism requires power to operate, and this usually can be generated by the plant. The disposal of power to advantage has been a problem of many American cities.

The reduction of the volume of material to be consumed by the furnace has increased the plant capacity and decreased the volume of final residue. This is accomplished by a variety of screening and other salvage methods. Such salvage not only includes those materials commonly salvaged in America but extends to ashes, other fine dirt and the clinker removed from these.

The clinker is crushed, graded and sold for concrete aggregate. At one plant the graded clinker is used as aggregate for asphalt paving, the mix being prepared at the plant.—John B. C. Kershaw, *Eng. News-Rec.*, 97:536 (Sept. 30), 1926. Abstr. by G. H. Hazlehurst.

Air Drying of Sewage Sludge in Glass Covered Beds—The greenhouse-covered sewage sludge beds at Marion, Ohio, received twenty applications of sludge during the year, and no trouble was experienced in drying the sludge during the winter. It is estimated that these sludge beds are capable of handling about three times as much sludge as could be handled on an open bed of equal area. A ratio of 2.6 to 1 represents the cost of each bed.

It is concluded, therefore, that glass covered sludge beds are not only more economical for

northern climates, but are much more advantageous in other respects than open sludge beds.—Floyd B. Browne, George B. Gascoigne, and Frank Woodbury Jones, *Water Works Eng.*, 65:374 (Aug.), 1926. Abstr. by R. J. Faust.

Place of **Reforestation in Water Conservation**—This is a noteworthy example in which water companies in the State of Pennsylvania are conserving their water supplies through the planting of trees and at the same time contributing to a reforestation problem. This article describes the manner in which 10,000 white and red pine seedlings were planted by the Sayre Water Company in the early spring of this year. It is stated that the water companies in the State of Pennsylvania have planted more than 5,000,000 trees in the past 10 years.—Charles D. West, *Water Works Eng.*, 79:1167 (Sept. 1), 1926. Abstr. by W. L. Havens.

Report of the **Advisory Committee on Atmospheric Pollution for Year Ending March 31, 1925**—This report presents the results of the year's dust sampling at 44 stations for which the records are complete. The report presents these data in 44 tables, the solids being classified as insoluble matter and soluble matter with analyses for the quantity of sulphates, chloride and ammonia. The data are averaged separately for the summer and winter months and in another summary the summer and winter results are compared by type of deposit. The striking fact brought out by this analysis is that the total deposits were higher in the winter in 16 cases and in the summer in 48 cases. Another very interesting fact is that the percentage of sulphur is very high in the country stations (e.g. Malvern) and the higher the quantity of solids the lower the percentage of sulphates. In other words, the quantity of sulphates varies little with increases of solids.

The results obtained with the automatic filter (devised by Dr. Owens) are given for 3 sampling stations, Blackburn, Stoke-on-Trent and Westminster. These, as in previous years, show with one exception (Westminster in winter) a lower air impurity content on Sundays than on Saturdays and a lower content on Saturdays than on the other 5 week days. All show higher results on days having haze than on clear days. The peak of the curves appears in most cases between 8 and 9 A.M. except at Westminster in the winter where the weekday peak is at 10 A.M. and the Sunday peak at 6 P.M.

A study of the impurity records during the winters of the year 1921–24, in relation to the wind velocity yielded a very interesting curve which is presented in the report, the formula being $I = \frac{.55}{V}$ (.27 where I = suspended impurity in milligrams per cubic meter and V = wind velocity in meters per second).

The report closes with an interesting and suggestive list of researches proposed by the Committee.—Meteorological Office, Air Ministry, London, England, *Eleventh Ann. Rep.*, 1925. Abstr. by Leonard Greenburg.

Operation of Indoor Swimming Pools—Brief data are given regarding the construction and operation of the 16 indoor swimming pools in Toronto. Three of the 16 are operated on the "fill and draw" plan, and the remainder are equipped with pressure filters and recirculating systems. The former are emptied weekly and the latter from twice monthly to once yearly, average being 2 to 3 times yearly. The average amount of alum employed varies from 0.06 to 0.52 grains per gal. Final disinfection with chlorine is employed in every case. The chlorine is added in the form of hypochlorite in 14 of the pools, the solution being usually sprinkled over the surface or applied in bulk at the inlets but in the other two pools automatic liquid chlorine apparatus has been installed.

Experience has shown that a residual chlorine content of 0.2 p.p.m. maintained throughout the bathing period is sufficient to destroy any organisms introduced. A residual of 0.5 p.p.m. may be safely employed without causing complaints regarding odor or effect on eyes and skin.—R. F. Heath, *Canad. Engr.*, 50:499 (Apr. 20), 1926. Abstr. by R. E. Thompson.

The Stability of Solid Calcium Hypochlorite—This article covers some experiments on concentration and stability of solid calcium hypochlorite that were made in India by the writer. The hypochlorite, a German preparation, was forwarded from England in November, 1923, and tested in February, 1924. The solid hypochlorite has the formula $Ca \begin{matrix} OCL \\ OCL \end{matrix}$ Theoretically, therefore, the available chlorine is about double that in "bleach" and more than double if little free lime is present.

The hypochlorite, which had an available chlorine strength of 74.4 per cent at start, was subjected to 5 tests, each of 10 months' duration, with the following results:

Available Chlorine at End of Ten Months	
(a) Cupboard (in the dark) ordinary storage	67.7 per cent
(b) Incubator at 37° C. 4 months, cupboard 6 months	56.0 " "
(c) Exposed to light	66.7 " "
(d) Exposed to vibration	67.7 " "
(e) Exposed to air	24.0 " "

Comparisons were made with stabilized bleach and ordinary bleach subjected to the same tests. Stabilized bleach with 17.7 per cent available chlorine at start gave the following percentages after ten months:

(a) Cupboard	16.1 per cent
(b) Incubator and cupboard	12.5 " "
(c) Exposed to light	15.7 " "
(d) Exposed to vibration	15.7 " "
(e) Exposed to air	8.6 " "

These results corresponded closely with those obtained with the solid hypochlorite.

Ordinary bleach with 19 per cent available chlorine gave the following:

(a) Cupboard 10 months	8.3 per cent
(b) Incubator 2 months	10.5 " "
(c) Incubator 4 months, cupboard 6 months	0.07 " "

Due to the small proportion of free lime, very little sediment is obtained when dissolved in water.

This preparation would appear to be of value where cost is of minor consideration, as in campaigns or maneuvers by armies; in epidemic work in districts where communication is bad; and the like.—Major H. H. King, *J. Royal Army Med. Corps*, 46:438 (June), 1926. Abstr. by R. E. Tarbett.

Ventilation of Textile Mills—This article discusses the theory of ventilation, pure air depending upon physical conditions rather than on chemical composition; humidity control; air movement; and the removal of dust and odors.—C. L. Hubbard, *Textile World*, 49:75 (Jan. 2), 1926.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH.D

Lead Poisoning in Mining of Lead in Utah—One becomes convinced, when reading this paper, of the fact that the mortality from lead is not an index of any value of the amount of disease caused by the absorption of this material. The records of the Utah State Board of Health show a very small amount of lead poisoning in the years 1910–22. Never in any one year were more than 6 cases reported. The extent of lead poisoning is 7 per thousand employes for the year 1920 and 5 per thousand for 1919. From a set of hospital records it appears that between the years 1904 and 1919 there were 244 cases of lead poisoning, in the Miners' Union Hospital, Park City, alone.

A review of literature is presented which discusses the toxic quantity of common lead salts encountered in mining. The remainder of the pamphlet is devoted to a discussion of various factors in lead poisoning such as symptoms, diagnosis and treatment, all of which is based on material taken from the literature.

The prevention of lead poisoning is discussed in an adequate manner. The part played by the company, namely, the use of wet drilling, the sprinkling of muck piles and blasting only at the end of the work shift are emphasized. The author also stresses the importance of adequate ventilation. The pamphlet also considers the responsibility of the employe.—A. L. Murray, U. S. Bureau of Mines, *Technical Paper 389*, Washington, D. C., 1926. Abstr. L. G.

Metal Fume Fever—The resistance to repeated attacks of metal fume fever has long been of interest to workers in industrial hygiene. This contribution details the results of 2 successive exposures to zinc oxide fume and represents an interesting and productive study of this subject.

The subject breathed the freshly prepared fumes of zinc oxide retaining approximately 12 mgs. on the first exposure and one day later retained 17 mgs. on the second exposure.

The first exposure was followed by the customary symptoms of chilliness, a rise in body temperature and an increase in leucocytes particularly in the polymorphonuclear leucocytes. The second exposure took place when the white blood cell count was still greatly above normal.

but in striking contrast to the results of the first exposure the number of white blood cells tended to fall to normal instead of increasing after this second exposure.

On the day following the first inhalation of fumes, the subjects experienced a fair degree of weakness and debilitation. Curiously enough on the day following second exposure the subject was completely free of distressing symptoms and in normal health.—II. *Resistance Acquired by Inhalation of Zinc Oxide on Two Successive Days*—Philip Drinker, R. M. Thomson, and J. R. Finn. Abstr. L. G.

Relation of **Atmospheric Conditions to Working Capacity and Accident Rate of Coal Miners**—This investigation was conducted in order to determine the influence of temperature of the working environment on production and on the amount of time required by the worker for rest periods during the course of the work day.

It was found that in an atmosphere with a wet kata cooling power of 14 to 19 the workers required 7 minutes of rest per hour, while in an atmosphere having a cooling power of 5 to 7 millicalories per square centimeter per second as determined by the wet kata thermometer they rested 22 minutes in each hour. Production was found to differ under these two conditions. In the one case of the high cooling power a mine car was filled in 8 minutes, whereas under the lesser cooling conditions a mine car was filled in 9.6 minutes.

The accident rate also appears to be influenced by atmospheric conditions. In one colliery kata cooling powers of 15.2, 11.3 and 10.2 were associated with accident severity rates of 3.2, 4.8 and 4.9 respectively. In another colliery where the ventilation in the airways was particularly poor, the accident severity rate among underground workers was 55 per cent greater than in another colliery where better conditions prevailed. The authors believe that the more adverse the atmospheric conditions the greater the reduction in the health of the miners.—H. M. Vernon and T. Bedford, Medical Research Council, Industrial Fatigue Research Board, *Report No. 39*, London, 1927. Abstr. L. G.

Silicosis **Among Miners**—Dr. Sayers discusses the prevalence of this disease in the United States, Great Britain, South Africa and certain other countries. He points out that previous occupation may play a definite part in predisposition to silicosis, coal miners apparently being less susceptible than average persons. He then discusses the theories as to the cause of the harmfulness of silica dust, and cites the work of Gye and Mavrogordato along these lines.

He believes that the effect of good air (and it is presumed that by good air he means outdoor air or dust free air) has a beneficial effect on a person who is suffering from silicosis, and that even if a person has third stage silicosis he may recover. This is a finding not generally agreed upon by most experts in this field.

A discussion of methods for the determination of dust in air is presented and a discussion of the methods for the protection against dust. So far as mining is concerned Dr. Sayers places great emphasis on water blasts and water sprays and still greater emphasis on wet drilling methods.—R. R. Sayers, U. S. Bureau of Mines, *Technical Paper 372*. Washington, D. C. Abstr. L. G.

Metal Fume Fever—I. Clinical Observations on the Effect of the Experimental Inhalation of Zinc Oxide by Two Apparently Normal Persons—This paper records the clinical data on 2 subjects following exposure to the fume of zinc oxide.

Both subjects were normal males who for 5 days prior to the exposure refrained from inhaling the fumes of zinc oxide although both had during the 2 years prior to the studies here reported been subjected to these fumes many times.

The fumes were produced by the oxidation of a very high quality of zinc in a stream of oxygen and after one-half hour the subjects entered the breathing cabinet in which the fumes were confined.

It is estimated that subject A retained approximately 24 mgs. of the material and subject C about 37 mgs.

The chief results of this exposure were to raise the body temperature of both subjects in from 7 to 10 hours, to increase the leucocyte count and to decrease the vital capacity. The leucocyte changes were the most interesting. These changes take place in the form of waves and consist chiefly in an increase in the polymophonuclear cells. In the case of C the white cells reached a high point of 18,150 and in A, 16,850. The leucocyte count was still much above normal 38 hours after exposure. Roentgen ray examination of the lungs showed no significant changes even though the vital

capacity had been depressed 18 per cent in one case and 53 in the other. Urinary changes were completely negative.—C. C. Sturgis, Philip Drinker and R. M. Thompson. Abstr. L. G.

On the Design of Machinery in Relation to the Operator—This pamphlet records the preliminary results of a study undertaken to ascertain the avoidable sources of fatigue in the operation of existing machines of certain types with the object of suggesting remedies and arriving at some general knowledge useful as a basis for future design work.

A grouping of the various kinds of machines is given and the principal relations of these machines to the worker is analyzed under the captions of movement, posture, effort, danger, shock, vibration, noise, obstruction, motion and adjustment.

A study of the elbow height of 200 girls shows this to average 39.5 inches, a very important figure to bear in mind when machinery for the use of females is being designed.

The remainder of this pamphlet is devoted to a description of certain selected types of machines and a discussion of suggestions for their improvement. This discussion covers laundry machinery, leather working machinery, and certain miscellaneous machines as boring mills, brush making and tobacco machines. It is quite impossible in an abstract to describe the changes suggested for these various machines. A reading of the paper leaves no doubt in the mind of the abstractor that the technic of analysis and improvement utilized in this paper is an exceedingly valuable one. It should be in the hands of every machine designer.—L. A. Legros and H. S. Weston, *Report 36, Industrial Fatigue Research Board.* London: 1926. Abstr. L. G.

Dust Respirators, Their Construction and Filtering Efficiency—This contribution reviews briefly the hazards of dust in industry, and enumerates the various types of respirators and masks used for the protection of the worker against the inhalation of these materials.

The optical method in use by the U. S. Bureau of Mines for determining the efficiency of respirators when tested either with tobacco smoke or silica dust is described in some detail. A description of the results obtained on the various types of respirators described earlier is included.

The efficiencies of the industrial dust respirators tested by these workers was found to fall in a range from 5 to 33 per cent when tested against tobacco smoke. A gas mask canister was found to be 63 per cent efficient and the Fogler flat felt filter developed an efficiency of 97 per cent. When tested against silica dust the efficiency of these devices was found to be higher, from 9 to 70 per cent or roughly about twice that obtained when using tobacco smoke. As a result of these studies the U. S. Bureau of Mines has adopted 50 per cent efficiency against tobacco smoke as a standard requirement for dust respirators. It is, of course, understood that these tests do not in any way take account of the loss of efficiency in practice due to the leakage which usually takes place between the edge of the respirator and the face of the wearer.

The resistance of dust respirators to the passage of air is a very important factor concerning their use. It was found that the resistance of most respirators varied from 0.25 to 1.5 inches of water. The Fogler flat felt filter and the gas mask cannister had resistances of 2.25 and 3.6 inches respectively.

The clogging effect of various dusts on the efficiencies of filters was studied by these workers. It was found, of course, that the efficiency and resistance both increased with increase of clogging.

A new type of dust respirator was designed by these workers in the form of a cap or turban fitting on the head and supplying air by means of a rubber tube running over the forehead and between the eyes to the nose which is covered with a small rubber nose cap. At an air flow of 85 liters per minute the resistance was found to be 1.2 inches of water and the efficiency 58 per cent against tobacco smoke and 93 per cent against silica dust.—S. H. Katz, G. W. Smith and E. C. Meiter, *Technical Paper 394*, U. S. Bureau of Mines, Washington, D. C., 1926. Abstr. L. G.

FOOD AND DRUGS

WALTER S. FRISBIE

The **Composition of Peanut Meal and Its Use as a Diabetic Food**—Data on the composition of choice peanut meal, including the distribution of carbohydrates, are given as follows: Moisture 6.50 per cent, ether extract 10.50, alcohol extract 16.07, carbohydrate of alcohol extract as glucose 3.49, carbohydrate hydrolyzed by enzymes as glucose (other than alcohol extract) 3.19, carbohydrate hydrolyzed by acid as glucose (other than alcohol extract) 10.96, total hydrolyzable carbohydrate 14.45, utilizable carbohydrate 6.68, non-utilizable carbohydrate 7.77, pentosans 4.99, nitrogen x 6.25 51.56, ash 3.77, crude fiber 4.50, and undetermined by difference 8.72 per cent.

On account of the small amount of utilizable carbohydrate, as compared with 8.15 per cent for soy bean commonly used as a diabetic food and 75.01 per cent for wheat flour, a study was made of the possibility of using peanut meal in bread making as a substitute for wheat flour in proportions higher than those recommended by Johns and Finks (E. S. R. 43, p. 763). It was found possible to make a palatable bread with the substitution of peanut meal for as much as 50 per cent of the wheat flour by first toasting the meal and making it into a mush before mixing with other constituents. This is estimated to reduce the available carbohydrate about 45 per cent (from 20 to 8.4 gm. per slice.)—M. K. M. Neale, *J. Am. Dietet. Assn.*, 2:73-85, 1926. Abstract, *Exper. Sta. Rec.*, 56: 92 (Jan.), 1927.

A Proposed **New Food Dye**—A new green dye, Fast Green F. C. F., belonging to the triphenylmethane group of acid dyes, similar in general composition to Light Green S. F. Yellowish and Guinea Green B, the present permitted green dyes, is under consideration by officials of the Bureau of Chemistry as a suitable food color. It has passed the physiological tests required by the U. S. Department of Agriculture of coal-tar bodies to be used as coloring in foods. It is a fast, non-fading dye more intense than the present two green dyes.—H. Johnson and P. Staub, *Indus. Eng. Chem.*, 19:497 (Apr.), 1927.

Food Value of Canned Peas—General principles of what constitutes an adequate diet are discussed with special consideration to peas, fresh and canned. Peas are deficient in fat but of value as a carbohydrate and protein food. Of the mineral elements necessary peas as compared with other foods contain a fair portion of calcium and phosphorus and a high one of iron. Canning will not materially affect these values if the liquor from the peas is used. Results with canned peas agreed with those of other workers showing high vitamin A content. Canned peas are shown to be a valuable source of vitamin B. It was found that 8 g. of the liquor would produce the same growth as 2 g. of canned peas in a diet deficient in vitamin B. Others found peas rich in vitamin C and the author reports agreement with others on their deficiency of vitamin D. No. 3 size pea is the one that has the largest average quantity of all the vitamins.—Marie Dye, *Canning Age, Convention Digest*, 213, 1927.

Research on Metallic Cooking Utensils at Mellon Institute—Dr. Edward R. Weidlein, director, Mellon Institute of Industrial Research, University of Pittsburgh, has announced the appointment of Dr. Erich W. Schwartze to the senior incumbency of the Institute's Multiple Industrial Fellowship on Cooking Utensils.

This fellowship has been recently established for the purpose of making a comprehensive chemical and pharmacodynamic study of the effects of the corrosion of metallic cooking utensils during the preparation of foods therein. The investigation will cover the effect upon the animal body of the metal taken up by and ingested with the cooked food as well as the effect of the material of the utensil upon the food constituents, particularly the vitamins, during culinary, food manufacturing and sterilizing operations. The researches will be conducted along the most approved scientific lines, and the results will be published from time to time as they become available.

Dr. Schwartze is a specialist in food research involving chemistry, physiology, and

pharmacology. During the period 1916–1926 he was associate pharmacologist, in charge of pharmacological investigations, in the Bureau of Chemistry, Department of Agriculture, Washington, D. C., but he spent one year (1923–1924) at the University College, London, England, as a fellow in medicine of the National Research Council. Dr. Schwartze is well known scientifically because of his published contributions to the literature of the chemistry and pharmacology of cottonseed, peanut oil, and of metals, especially tin and cadmium, used in the construction of food containers.

Dr. Schwartze will be assisted by Frank J. Murphy, a Junior Industrial Fellow of the Institute who has been engaged in food and nutritional investigations.—Announcement from Mellon Institute of Industrial Research, Pittsburgh, Pa.

Antiscorbutic Activity of Milk from Cows Receiving Silage—Its Biological Value in Comparison with Milk Produced by Feeding Dry Fodder and Brewers' Grains and Its Suitability for Children—In experiments with guinea pigs, cow's milk, produced by feeding silage, induced better growth and showed greater antiscorbutic power than milk from dry fodder (hay); and its superiority in both respects was still more marked over milk from brewers' grains. The high biological value of milk from silage and its special suitability for children are discussed.—F. Kieferle and K. Zeiler, *Fortschr. Landw.*, 1:83, 1926; *Bied. Zentr.*, 56:37–39, 1927. Abstr., C. T. Gimingham, *Brit. Chem. Abstr. B*, 46:202 (Mar. 18), 1927.

The Effect of Luxus Meat Consumption on Activity and Growth—Although the minimum protein requirement for man and many of the lower animals has been fairly well established, there is but little convincing evidence as to what constitutes the optimum level of intake. The purpose of this investigation was to attempt to establish the optimum level of protein intake for the white rat by adding a liberal quantity of meat to a diet already adequate. The voluntary activity of the animals was determined by means of a retiring cage containing a revolving wheel, to which was attached a counter of the ratchet type which recorded the number of revolutions. The results of this investigation showed that the addition of 8 g. of meat daily to the diet of rats already receiving a ration containing approximately 28 per cent of protein, mostly casein, had but little effect upon the voluntary activity of the animals. In some cases it was apparently depressed, in others there was a slight increase. The animals receiving meat grew more rapidly and at maturity weighed about 20 per cent more than the controls. Recovery from starvation was more rapid and complete in meat fed animals than in their controls. Female rats that were nursing litters weighed more and raised larger and healthier litters when they were fed meat in addition to an adequate balanced ration. The rate of growth of the new-born rats was faster when their mothers received meat.—F. A. Hitchcock, *Am. J. Physiol.*, 79:206 (Dec.), 1926.

Comparative Value of Butter and Cod Liver Oil as Sources of Vitamins A and D—References are frequently made to the comparative values of butter and cod liver oil with regard to their vitamin content. The statement is not infrequently made that cod liver oil may be 250 times as potent as butter in promoting the growth of young rats. Various comparative values have been reported by different investigators. Unfortunately, none of them gave consideration to the possibility that the antirachitic and the antiophthalmic properties might be resident in distinct compounds, and little control was exercised over the inorganic composition of the diet. In the work of previous investigators, in no case has the antiophthalmic property been compared in the same samples. This has been the object of the work described in this article. The determinations of the vitamin A content were made with rats. The antirachitic factor was determined with dogs. In the experiments with rats, both the curative and prophylactic methods were used. Using the time of incidence as well as the cure of ophthalmia as criteria, it was determined that cod liver oil contains from 10 to 20 times as much vitamin A as butter fat. The cod liver oil was a well known commercial product, and the butter fat was obtained from a creamery in November, as a representative sample of the day's churning. In antirachitic factor, the difference in potency was much greater; 0.05 g. of cod liver oil was far more effective in preventing rickets than 10 g. of butter fat, which gives them a relative value of approximately 1 to 200. These values, however, will vary with the seasonal conditions under which the butter fat and cod liver oil are produced, and the method of preparation of the latter. Inas-

much as the antirachitic factor as well as vitamin A is required for normal growth, the statement that cod liver oil may be 250 times as potent as butter may be taken to refer more to the antirachitic factor than to vitamin A.—J. H. Jones, H. Steenbock and M. T. Nelson, *J. Metab. Res.*, 6:169 (July-Dec.), 1924.

Red **Meat and White Meat**—This editorial article points out that the idea once prevalent among physicians that patients with kidney disorder or with hypertension should avoid red meat and eat only white fleshed foods, because red meats were supposed to contain more purines than white meat, has largely disappeared. This idea was held because purines are precursors of uric acid. Neither is it now believed that uric acid has the ill effects it was formerly believed to have, nor has the belief that red meats are richer in purines than are white meats been corroborated by chemical analysis. However, the discrimination between red and white meats may find some justification in the differences in texture of the muscle from different sources, rather than in the once alleged harmful ingredients. Meats contain collagenous and elastic tissue. In the raw condition, the fibrous connective tissue (chiefly collagen) is nearly twice as tough as the yellow connective tissue (mainly elastin). On cooking, the former loses most of its toughness, while the latter remains practically unchanged. In this connection, reference is made to the work of Mitchell, Zimmerman and Hamilton (*J. Biol. Chem.*, 71:379 [Jan.], 1927), who made analyses of the connective tissue components of various types of flesh. They showed that the breast muscle of young chicken has less than 4 per cent of its nitrogen in the form of connective tissues. The proportion in the thigh muscles (red meat) of the same animal may reach nearly 15 per cent.—*J. A. M. A.*, 88:928 (Mar.), 1927.

Iron in **Nutrition**—In a previous publication it was shown that the nutritional anemia induced in rabbits by whole milk diet could not be corrected by the addition of ferric oxide, unless there was also added to the diet either fresh cabbage or an alcoholic extract of desiccated cabbage or of corn meal. From these experiments it was concluded that some organic nucleus necessary for hemoglobin building was absent or deficient in whole milk. The work described in the present article was undertaken to determine whether the ash of these materials would be effective. Rabbits were used mainly for the experimental animals. The results obtained indicate that "the deficiency of cow's milk in respect to its anemia producing properties is not an organic principle, but something of inorganic character resident in the ash of certain plant and animal tissues. Nutritional anemia induced by whole milk—ferric oxide diet can be corrected by the ash of lettuce or by the ash of cabbage. While alcoholic extracts of these materials as well as the alcoholic extracts of corn are also potent, the ash of corn grain is not particularly effective. During the ashing process the corn grain ash has become partially inactivated. Spleen marrow, while it is definitely potent, loses its potency in part during the ashing process. The ash of an alcoholic extract of cabbage is also potent. Such extracts are effective in a system of whole milk—ferric oxide, and are practically iron-free. The ash of the alcoholic extract of lettuce is distinctly potent, but is not free from iron. Impure, soluble ferrous sulphate was a much more effective agent in the prevention or cure of nutritional anemia on a whole milk diet than purified preparations of this salt. Further investigation must definitely decide whether we are dealing with extra inorganic factors other than iron, and the nature of such factors."—E. B. Hart, C. A. Elvehjem, J. Waddell and R. C. Herrin, *J. Biol. Chem.*, 72:299 (Mar.), 1927.

Growth on Diets Rich in Fat—In certain experiments with animals fed mixtures of purified food material, so-called synthetic diets, it is often desirable to shift the proportion of organic nutrients—fat, protein and carbohydrates—to extremes, without encountering abnormal effects in the animal organism. The experiments reported were undertaken to demonstrate the effect upon growth of rations high in fat and practically devoid of preformed carbohydrates. From the results of the experiments it was found that "growth at a normal rate from 30 to 180 grams in body weight can be induced in rats on a high fat ration practically devoid of preformed carbohydrates and containing 86 per cent of the total calories in the form of fat, provided the protein and salt requirements of the animals are fulfilled." "Comparisons were made of the efficiency, in growth, of calories furnished on the one hand by a high fat diet (practically devoid of preformed carbohydrate and containing 86 per cent of the calories in the form of fat), and on the

other, by a better balanced ration (containing 39 per cent of calories derived from carbohydrate and 47 per cent of the calories in the form of fat).

It appears that rats receiving all of the calories in the diet in the form of fat can grow as efficiently, measured by energy cost, as when a mixture of calories derived from both fat and carbohydrate is present in the ration."—H. Levine and A. H. Smith, *J. Biol. Chem.*, 72:223 (Mar.), 1927.

Calcium in Blood Serum and Vitamin B Deficiency—The characteristic symptoms of B-avitaminosis in chickens and pigeons as manifested by cramps in the neck musculature has been referred by other investigators to a lack of oxygen in the tissues and comparable to cyanogen poisoning. The work reported in this article was undertaken in order to test out an hypothesis that the cramps are due rather to an abnormal functioning of the parathyroids. Characteristic of a hypo functioning of the parathyroids is a decrease in the calcium content of the blood serum. Analyses of the calcium content of the blood serum of polyneuritic pigeons showed, however, no difference from that of normal pigeons, indicating that the cramps manifested in experimental beriberi are not associated with a hypo functioning of the parathyroids.—A. Ungar, *Biochem. Zeit.*, 168:357 (Jan.), 1927.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

What Is the Future of the Day Nursery?—Shall day nurseries give way to nursery schools? Has the extension of mothers' aid and assistance from private family welfare societies rendered the day nursery unnecessary?

These are interesting questions in the light of the attention now being paid to the child of preschool age. There have always been those who doubted the wisdom of the day nursery. Miss Abbott in her article does not commit herself to this position. She does point out the fact that as yet the nursery school has not become an integral part of the general educational program in the eyes of the public as a whole. Reference is made to the hopes that were aroused by the Fisher Education Bill in England, hopes not realized so far as nursery schools are concerned because of an economy program.

Pending a decision regarding the nursery school, the day nursery seems to be still a definite part of the relief program of family welfare societies. The census report for 1923 gives 613 day nurseries caring for 22,822 children; of these day nurseries only 15 were supported by public funds.—Grace Abbott, *Child Health Bull.*, Feb., 1927.

Report of the Conference of Health Experts on Infant Welfare Held at Geneva in September, 1926—At the conference of Child Welfare health experts the following agenda were adopted:

1. Possibilities of a comparative enquiry into infant mortality in different regions of Europe (or other parts of the world) with high and low infant mortality rates—with special reference to the underlying causes, such as social and hygienic conditions, housing, nutrition and child welfare activity.

2. Possibilities of an enquiry into the incidence of rickets, anaemia, tetany and scurvy in children up to two years of age in different countries, with special regard to the nutrition problem.

3. Unification of the registration of infant deaths.

4. The possibility of facilitating climatic treatment for children of foreign countries. Measures required in the interest of the children and of the country which receives them.

5. Instruction in infant welfare of medical students and other persons concerned.

6. The value of preventive immunisation against infectious diseases of children (diphtheria, scarlet fever, measles, chickenpox, whooping-cough and tuberculosis).

The conference recognized that a comparative inquiry into mortality in different countries was one of the most important matters submitted for consideration and recommended that such an inquiry be made. The investigation would refer to the year 1924, but statistics for the period 1921 to 1925 will be utilized. The age of the child will be from birth to 1 year, the inquiry to consider only the most important causes of infant mortality, namely, premature birth, injury during birth and congenital defects, deaths ascribed to debility, respiratory

diseases, enteric diseases, infectious disease including tuberculosis and syphilis.

Complete medical data are to be obtained and also anything relating particularly to the public health and social factors. Information will be obtained from general practitioners, hospitals, public health nurses, midwives and others. The conference considered that the inquiry should include not only infant deaths but all births and also that all dead births should be included. A dead birth was defined as follows: "The birth of a foetus after 28 weeks' pregnancy in which pulmonary respiration does not occur; such a foetus may die either (a) before, (b) during or (c) after birth, but before it has breathed."

The districts provisionally selected for this study are in Australia, England, France, Germany, Holland and Norway. A detailed questionnaire for the use of the investigators is attached and also a nomenclature of diseases common to the first year of life which would be very useful in any such study.

The Problem of Fetal and Neonatal Death—A careful survey of the literature on this important subject has been made by Dr. Sterling who appends a considerable body of references to her paper. The conclusions which she draws are:

1. Fetal and neonatal mortality is the greatest problem in infant mortality. No other field of public health work requires more intensive study.

2. Early infant mortality varies with racial stock for reasons as yet unknown.

3. Syphilis is the only cause of which we have sufficient knowledge to hope for complete success in prevention.

4. The paramount importance of birth injury renders imperative Holland's statement that we must learn how to reduce the occasions for interference with natural birth.

5. Infections in the new-born should be made the subject of special study.—E. Blanche Sterling, M.D., *Pub. Health Rep.*, Mar. 18, 1927.

Endemic Thyroid Enlargement in Massachusetts—Drs. Olesen and Taylor in this paper give the results of a sampling which they carried on in various parts of Massachusetts to determine the incidence of thyroid enlargement, particularly among the older school children. Studies were made both along the coast and in the western part of the state, the farthest from the ocean.

The writers' summary of their study is as follows:

1. The thyroid survey in Massachusetts included 7,140 boys and 10,057 girls residing in 57 localities and attending high school or upper grades of grammar school.

2. A total of 2,838 thyroid enlargements, a percentage of 16.5, were found among the 17,197 children examined.

3. Thyroid enlargements of all degrees prevailed among the boys to the extent of 8.7 per cent and among the girls to the extent of 22 per cent.

4. By far the greatest number of thyroid enlargements were very slight in character and consequently dubious as to significance. Very slight thyroid involvements were present in 7.7 per cent of the boys and among 16.2 per cent of the girls.

5. Slight thyroid thickenings were noted in 63 boys, moderate thickenings in 10, and marked thickenings in only 2. Slight enlargements were recorded in 502 girls, moderate enlargements in 76, and marked enlargements in 6.

6. The customary decline in thyroid involvement as the higher ages are reached among the boys and the reverse condition among the girls were noted.

7. In Massachusetts, goiter is least prevalent in the eastern portion, the rates being particularly low on Cape Cod. In the central and western sections of the state, endemic thyroid enlargement is present to a relatively greater, though not undue, extent.

8. A comparison of thyroid enlargement in Minnesota, Cincinnati and Massachusetts shows that while the trends are distinctive and similar, the malady is least prevalent in the last named.

9. When thyroid incidence in Connecticut and Massachusetts is compared it is found that the affection is slightly more frequent among the Massachusetts boys and less frequent among the Massachusetts girls.

The writers go on to say that in their opinion the conditions found do not call for special preventive measures on the part of state and local health departments.—Robert Olesen, Surgeon, and Neil E. Taylor, Acting Assistant Surgeon, U. S. Public Health Service, *Pub. Health Rep.*, Mar. 25, 1927.

What Shall We Do with the Child Who Has Heart Trouble?—In this brief article Brachman discusses the two groups, children having congenital heart trouble, and those in whom the condition is acquired. He points out

that in the first group, the cyanotic type offers a poor outlook, since adult age is seldom reached; the non-cyanotic type offers a better outlook provided due care is taken to guard against infection and strain. Those in the second group, namely, that in which the disease has been acquired, need prolonged rest in bed—6 months or more—during the acute stage and attention to underlying causes of infection.

The writer offers this advice to those in charge of heart cases in children:

A thorough examination to find out the exact status of the affection

Complete rest in bed under competent supervision for those in the acute stage

Open air schooling with proper rest and food for those in the quiescent stage

All defects such as diseased tonsils or teeth corrected at once

Attention to general hygienic measures

At the end of school life is advised training for a suitable occupation which takes into account the relative inefficiency of the patient's heart.—D. S. Brachman, M.D., D.P.H., *Bulletin*, Tuberculosis Society of Detroit and Wayne County, Feb., 1927.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN *

"Ask Me Another" About Public Health—The sale of 100,000 copies of *Ask Me Another* in four weeks, with a rising demand for that book and the quick publication of several other books of the same type suggests strongly that health workers may find a new vehicle for public health information by catching up with the current fad.

The questions compiled might apply to your local, state or national health activities, or to such topics as birth registration, communicable diseases in general or one of them in particular, and so on. But it is important that the questions and the answers be well thought out and expressed in the language of the newspaper and not of the public health worker. They should be concrete, not vague generalizations, and both questions and answers should be brief. They might be used in bulletins, and in many cases there will be opportunities for local newspaper publication. A state department or association might send them to local departments or associations for local publication. A series about the state health work might be supplemented by suggestions of a form to be worked up about the local work.

The following assorted questions were prepared by James A. Tobey, who did not supply the answers:

What is the name and sex of the mosquito which carries malaria?

Who discovered the germ of tuberculosis?

Where was vaccination against smallpox developed and by whom?

What did Walter Reed do?

Is influenza communicable?

What substances (foods?) are usually pasteurized in order to make them safe?

Will sunlight cure any disease?

Should health officers serve full time or part time?

How can diphtheria be prevented?

Who was Pasteur?

How many known vitamins are there?

What is a health examination?

What diseases may be spread by contaminated water?

Is there any difference between mental hygiene and Christian Science?

Could a series of questions be broadcast, with prizes for the best series of written answers? (In this case it might be well to number the questions so that they need not be written out by those who send in answers.) Could you put the questions to a leading citizen who would be willing to broadcast his answers? Then those who listen in would report on any incorrect answers.

Postscript of importance: *If we wish to ride on a popular interest wave we must make our material popular.* A Boston paper carried some questions last week from a social agency which included vague abstract ideas, social work patter and other deadly dull words. Let's not do this heavily and without imagination.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York City.

Girls' Health Year—"A campaign known as Girls' Health Year was launched in Cleveland in January under the auspices of the Anti-Tuberculosis League. The purpose is to create and maintain interest among girls in radiant good health. The education of parents, teachers and volunteer leaders in the health needs of girls, promotion of wider interest in outdoor sports, the general use of a health chart under the leadership of organizations like the Y.W. C.A., Girl Scouts and others, and a new project each month to keep interest alive, are features of the campaign. For further information and samples of material address Virginia Wing, Cleveland Health Council, Electric Bldg., Cleveland."—*News Bulletin*, Committee on Publicity Methods. Mar., 1927.

The **County Fair Season Is Coming**—Suppose that in your county fair or industrial exposition exhibit you choose to specialize on lunches for father or big brother who works in a factory, or for the child who carries a lunch to school. You might collect pictures of foods, cut them out, and mount them so that they will stand on narrow shelves along the back or sides of the exhibit booth. Possibly they could be hung from the walls of the booth. After a few chatty sentences explaining the importance of proper diet, the attendant may display typical lunch boxes carried to factories or schools, and point out what is wrong with them. Then she may ask the audience to select from the pictures the contents of a good lunch box. Small prizes may be offered for the best menus for a week's lunches, written on blanks printed for the purpose. Prizes would be awarded on the last day. Newspapers would undoubtedly coöperate.

Boy Scouts Bring Publicity for Diphtheria Campaign—"The Boy Scouts had what they termed a Panjandrum during the first week of the diphtheria campaign in Syracuse. At the opening of the Panjandrum Boy Scouts were stationed on the roofs of the various newspaper offices in Syracuse and in the mayor's office. The boys in the mayor's office signalled to the boys on the roofs of the newspaper offices the mayor's greetings to the Boy Scouts and his wish that every boy in Syracuse would be protected against diphtheria. This stunt which was arranged by the Onondaga Health Association proved tremendously successful and gained us the desired space in the newspapers."—Louise Franklin Bache.

Intensive Education Through Clinics—In Syracuse "we are trying to make our department of health clinics educational centers. While the patient waits we are attempting to give him health education in the form he will find palatable. To this end we have a poster scheme which we are following closely. Instead of hanging on the walls of our clinics posters dealing with various health subjects we play up for a period of not more than a month one special health subject. It might be nutrition for one month, exercise for another, and so on. Each clinic has its scheme of education and the posters are changed in order to illustrate the lessons in this scheme. We are also planning exhibits for some of the clinics. Our first one illustrates a house of health. It is a miniature apartment for the family of moderate circumstances, in which we have put the necessary sanitary equipment and have illustrated certain rules which make for health in pictorial form. The house is at present located in our chest clinic and is attracting much attention. It will be moved in time to another clinic and another exhibit substituted in its place."—Louise Franklin Bache.

A Problem in England—"Discussions of publicity methods emphasized the importance of a choice of media—a well written, popular article couched in simple, untechnical terms in a household magazine read by hundreds of mothers being far more effective than a more literary presentation of facts in a big daily newspaper. The importance of keeping the public informed about the work and results obtained at the centers, with a freer discussion in public of the midwifery and maternity services and their usefulness was emphasized. It was urged that health and welfare workers keep the newspapers supplied with good 'copy.'"—Under "Propaganda and Publicity," in "Fourth English-speaking Conference on Maternity and Child Welfare," *World's Health*. Dec., 1926.

A German Looks at Health Education—"Manuals on hygiene publicity have frequently appeared in the United States, but the *Handbuch der Sozialen Hygiene und Gesundheitsfürsorge* is, unless we are mistaken, the first of the kind to appear in Europe," says *World's Health*, Dec., 1926. The half page review closes with this: "The author closes his international review by summarizing what has been done in this field in the United States. He considers

that it leads all civilized countries in the matter of propaganda and the degree of government intervention.

"A very useful, though not exhaustive, bibliography completes this interesting little work."—*Hyg. Volksbildung*, by Dr. Martin Vogel, Reprint of *Handbuch der Sozialen Hygiene und Gesundheitsfürsorge*, Vol. 1, Julius Springer, Berlin, 1925. 88 pages.

Another Classification for Publicity Files—Following are some of the headings used in assembling material for this department of the JOURNAL: Annual Reports; Awards; Best Sellers; Bulletins; Campaigns; Characters; Comparisons—historical; Contests; Coöperating Groups; Dates Ahead; Distribution; Educational Material; Educational Publicity Section; Ethics; Events; Exhibits and Expositions; Folks We Know; Free Material; Health Columns; Honorable Mention; Lists; Looking Ahead; Mailing List Practice; Meetings and Conferences; Methods and Problems; Motion Pictures; Office; Opportunities; Plays; Popular Health Articles; Postal Information; Press; Press Copy; Press Releases; Public Speaking; Publicity Dictionary; Radio; Schools and Children; Slides and Film Slides; Slogans; Stories; Technical; Tests; Timely Topics; Titles; Training; Typography; Words.

A REQUEST

"To readers of the *U. S. Weekly Public Health Reports:* We are very desirous of making the weekly *Public Health Reports* of the greatest possible value and assistance to public health officials and others to whom they are distributed. In the accomplishment of this your full and frank comment and criticism are earnestly solicited. It is requested that you submit any suggestions that you may have as to the character of material that you would find of most value, and also as to any material now being included in the reports which you believe might be omitted without detriment." Address: H. S. Cumming, Surgeon General, Washington.

This department feels safe in extending a similar invitation on behalf of the AMERICAN JOURNAL OF PUBLIC HEALTH and all other professional and popular public health periodicals. We may count upon a cordial welcome for communications of information or suggestion addressed to any of these editors. Won't you submit your suggestion to-day?

OPPORTUNITIES

The *Publishers' Weekly*, 62 West 45th St., New York City, is the chief source of information about new books and pamphlets of significance to book stores, public libraries and college libraries. Educational or descriptive pamphlets and research reports likely to be of interest outside your own city or state will be considered by the editor for listing without charge. Be very sure to write the price or "Free" on the cover page of each publication.

The *American Journal of Sociology*, University of Chicago, Chicago, Ill., will welcome for its department of "News and Notes" information about research having a sociological aspect, and copies of completed reports on such studies.

NEW BULLETINS

The irregularly issued *Bulletin* of the American Hospital Association will now be issued quarterly.

A Letter to Each Member is the new house organ of the A.P.H.A. to be sent at frequent intervals to the entire membership.

EXHIBITS AND EXPOSITIONS

A display model to illustrate the giving of sunbaths for rickets is offered by the Children's Bureau, Washington—for express charges to and from Washington.

At the Dunkirk, N. Y., fair, nurses demonstrated "the latest ideas in outfits for the new baby and outlined how mothers' health clubs could be organized" according to the plans prepared by the State Department of Health.

Chattanooga Makes a "Big Noise" with Nutrition. *Red Cross Courier*. Sept. 15, 1926. Brief mention of a device for an exhibit at a fair.

Description of the Pennsylvania State Department of Health's Exhibit, Sesqui-Centennial Exposition, *Listening Post*, Harrisburg. Nov.-Dec., 1926. 2 illus.

Illustrative Panels on Child Welfare and Red Cross Activities, prepared by the Red Cross Museum. American National Red Cross, Washington. Free. Illustrates 42 "panels" each 30 by 40 inches. Two small red crosses in lower corners are the sole identification on most of the panels. Copies sold or loaned to local chapters.

Operating Scene Produced as Living Motion Picture. *Red Cross Courier*. Aug. 2, 1926. How Red Cross chapter nurses sought to dem-

onstrate to a Business and Professional Women's Club the care with which operations are conducted.

TECHNICAL

Health Compendium and Health Publicity, by T. Crew. Reader Printing Co., Sanvey Gate, Leicester, England, 1926. 260 pages. 8 shillings (special price to public health workers 6 shillings, 6 pence). Very interesting to those who wish to learn about health education and publicity methods and materials used in England. Descriptions of 190 health organizations—educational, professional and scientific—and organizations doing some health work. Reproductions of many leaflets, posters, etc., including some from Germany and a few from Canada and the United States. A health slogan on every page. List of health periodicals, and of health films and lantern slides available in England.

"New Ideas for Annual Meetings"; "Seeing is Believing" (come-and-see visits and graphic material); "When Social Work Is News"; "Attractive Printed Matter"; and "Magazine Writers Discuss Propaganda"—some titles in the March, 1927, issue of *News Bulletin*, Committee on Publicity Methods, 130 East 22d St., New York City.

RADIO

The Foreign Language Information Service, 222 Fourth Ave., New York City, reports the use of numerous radio talks in foreign language newspapers, including Do Athletes Die Young? (55 papers), Campaign for the Eradication of Diphtheria (46), Cause of Influenza Discovered (41).

Station WEEI is broadcasting a series of talks every other Monday afternoon provided by the Massachusetts Society for Mental Hygiene. List of topics in *Monthly Bulletin*, 5 Joy St., Boston, Mass. Free.

The Child's Lunch Box. Radio Health Talk No. 227. New York State Department of Health. This was the 227th weekly radio health talk arranged for by the New York State Department of Health.

Mr. Dooley and Mr. Hennessy. Radio Health Hint No. 114, New York State Department of Health. Infant Welfare, done in the style of Finley Peter Dunne, by Dr. William L. Munson. Broadcast and released to the press.

Nature's Cosmetics, by Elizabeth C. Nickerson. *Bulletin*, Conn. State Department of Health. Sept., 1926. Opening sentence: "A 'coat of tan' seems to be the latest style in natural coloring at this season of the year."

Postponing Your Own Funeral, by Philip P. Jacobs via Station WFBR. *The Double Barred Cross*, 900 St. Paul St., Baltimore. Sept.–Oct., 1926.

Quackery a State of Mind, by Benjamin C. Gruenberg. *Weekly Bulletin*, Department of Health, New York City, May 29, 1926.

To Broadcast or Not to Broadcast. *Better Times*. Apr., 1927. "Radio experts estimate the value of the air for social work and measure the possible returns in the light of commercial experience."

ANNUAL REPORTS

California State Board of Health. 1924–1926. Includes a striking chronological diagram of a smallpox outbreak. Several maps showing institutions and extension of activities. A formal cover page with the specific information that delights the librarian.

The Community Health Association, 502 Park Square Bldg., Boston, Mass. 1926. Effective use of diagrams in color, and full page photographs.

Union Health Center, 131 East 17th St., New York. 1926. Interesting for the paragraphic reports of types of services rendered and the variety of health education carried on. Several diagrams show the increased use since 1917.

1898–1926 Report of National Association for the Prevention of Tuberculosis, London, makes good use of contrasting maps. On one map about 17 red dots indicate the tuberculosis activities in 1898, with a companion map of Great Britain entirely in red to show the complete coverage by the 1926 activities. Another pair of maps in black and white present strikingly the lowered death rate from tuberculosis.

MEETINGS AND CONVENTIONS

Acting Our Age. *Womans Press*, New York City. Jan., 1927. Tells of National Board, Y.W.C.A., 20th anniversary. May stimulate imagination when you wish to recall the earlier days of your organization. 20 cents.

An interesting program feature of the American Home Economics Association, meeting at Asheville, N. C., June 21–24, will be an "annual progress meeting" in which representatives of the various sections of the association (including food and nutrition, and others) will give brief, vivid summaries of the year's scientific progress in their respective subjects.

Health Conference and Demonstrations Number, *S.C.A.A. News*, 105 East 22d St., New York City. March, 1927. Example of house organ reporting of a 2-day state tuberculosis and health conference.

EDUCATIONAL MATERIAL

Dogs and diphtheria are effectively combined to produce a 4-page folder that will surely attract the attention of every child or adult who loves dogs. The dog-diphtheria story runs through to the closing sentence without the abrupt change in style and type usual when the moral is pointed on the last page. (It was unfortunate that the abundance of fetching dog pictures led to the use of 4 small pictures without which the inside pages would be easier to read. Too many dogs spoil the story a bit!) State Charities Aid Assn., 105 East 22d St., New York City. 2 cents.

An Appeal from the Sick Poor. Public Health Federation, 312 West 9th St., Cincinnati. Free. A 4-page folder arguing for "yes" votes on sanatorium and hospital bond issues.

Catalogue of Educational Material Distributed by Division of Venereal Diseases, U. S. Public Health Service, Washington. 1927. Free.

Cross Section of Manufacturing Plant. *Better Times*. Apr. 4, 1927. This is a full page reproduction of a cartoon showing a cross section of the building of the Boys' Club of New York. It was originally printed as a sheet for enclosure with appeal letters and annual reports. The idea could be adapted to a picture of the activities of a clinic, health center or other health enterprise which occupies several floors. A copy of the cartoon will be supplied for a 2 cent stamp by Committee on Publicity Methods, 130 East 22d St., New York City.

The Economics of World Health, by Louis I. Dublin. *Harpers*. Nov., 1926. Reprinted by Metropolitan Life Insurance Co., New York City. Free. Ask for copies for editorial writers of newspapers and for a few influential, thoughtful citizens you wish to impress with the significance of public health work.

Getting the Light You Pay For. National Lamp Works, Nela Park, Cleveland, O. Free. Useful for your own offices and to send to hospitals, clinics, and all health agencies.

How to Die Before Your Time (6 x 9 inches, punched for hanging), is an experiment in using a negative appeal. "Men or women desiring to die 10 to 20 years earlier than they would otherwise be likely to die, should follow these rules," with nine rules. Onondaga Health Assn., Syracuse, N. Y. (ill. card), 2 cents.

How to Live 100 Years (5½ x 8 inches, punched) is a positive appeal with "health rules suitable for most adults." Note the qualifying "most." Address as above. 2 cents.

Is Your Child Ready for School? by James Frederick Rogers, U. S. Bureau of Education. 1926. "A guide to parents in preparing their children for school life." Superintendent of Documents, Washington. 32 pages. 10 cents.

Little Boy Blue, Onondaga Health Association. Syracuse. Four-page folder on diphtheria prevention with a strong emotional appeal to parents based on Eugene Fields' Little Boy Blue. The third page seems to tell all that needs to be told—and without naming toxin antitoxin.

Some Elementary Lessons in Social Welfare. *World's Health*. Jan., 1927. Two-page supplement in colors reproducing six posters and postcards from the Dusseldorf Exhibition. 20 cents.

What Every Food Handler Should Know. Bureau of Chemistry, Baltimore City Health Department. Free. A 4-page folder, with an excellent picture-diagram of right and wrong practices. Could be improved by underscoring "Right" in the title; and by lowering the subtitle, "Preparing Food for Table." This subtitle now seems to refer to the toilet and washbowl.

What Builds Babies, Sunlight for Babies, Breast Feeding, and Why Drink Milk? recently issued folders of the Children's Bureau, Washington, will be supplied free. Quantity prices upon request.

Educational material for selected audiences from State Charities Aid Assn., 105 East 22d St., New York City:

Health Demonstrations in the United States. 24 pages. Reprint from AMERICAN JOURNAL OF PUBLIC HEALTH. Feb., 1927. 5 cents.

Hospitalization for Tuberculosis, by Dr. David R. Lyman. 8 pages. 5 cents.

Medical Practice in a Small Town Grows with Health Work, by Dr. B. B. Bagsby, practicing physician. 4 pages. Reprint from *Virginia Medical Monthly*. Dec., 1922. 2 cents.

PUBLIC HEALTH NURSING

MIRIAM AMES, R.N.

PUBLIC HEALTH NURSING IN THE NAVY

J. BEATRICE BOWMAN

Superintendent, U. S. Navy Nurse Corps

ALTHOUGH the Navy has no public health nurses, termed as such, yet the Navy nurses in the island possessions of the Virgin Islands, Samoa and Guam, train the native women to go out among their own people to do public health and welfare work.

The Navy nurses were sent to the Virgin Islands in 1917. They were the first trained nurses on the islands and since 1917 there have been, at all times, 9 Navy nurses on duty there. Training schools have been established for the native women and, during the 3 year training, modern methods of nursing are taught.

In the obstetrical department, the native nurses are taught to deliver, and special attention is given to the care and feeding of infants. The infant welfare department numbers several hundred infants. Midwives are required to report their cases to the authorities within 24 hours. There are trained midwives on the islands who do excellent work, and in the district all cases which have been delivered in the homes by physicians are attended by a midwife who assists at the delivery. A native pupil nurse makes daily visits for 2 weeks thereafter, giving the mother and baby the routine daily care.

The Navy nurses first went to Samoa in 1913 and the training school for native nurses was established early in 1914. Although missionaries have been in the Samoan Islands for nearly 100 years, many of the old superstitions and practices are still in existence. Like all primitive people, they have been much afraid of doctors and their treatment. The training school is conducted very much like the school in the Virgin Islands, the pupils receiving a very thorough training in all modern nursing methods. The Navy nurses are responsible for this training and under the supervision of the naval medical officer, an excellent school has been established.

The graduate pupil nurses go out among their people, give simple treatments to those who are ill and refer those needing hospital care to the hospital. These district nurses are vested with a good deal of authority and the people in the villages know that if they do not obey them, they will be reported to the authorities who have the power to make them obey. The nurses are looked up to by most of the other natives as they are better educated as a rule, and even the men, who do not respect the authority of women, realize their helplessness in the matter of health and sanitation, if a native nurse discovers they are not living up to the standard. The nurses are expert in the treatment of conjunctivitis, of which there is much on the islands due to the prevalence of flies. Much blindness, or partial blindness, is found among the older people, but rarely now does a case miss the watchful eye of the district nurse. The usual tropical diseases abound and many times the patients wait to consult the nurse before going to the hospital. Mothers are taught the care of their children and much excellent work has been done in reducing infant mortality.

In Guam, the work is carried on in about the same manner. The Navy took over the station in 1898 and the naval hospital was placed in commission in 1910. Here also, the course of training is 3 years, and the school is conducted by the Navy nurses under the direction of the medical officer in command. Navy nurses who were ordered to Guam in 1911 were preceded by a splendid woman, Maria Roberta, who, though born in Guam, is of Spanish and Chamorra origin and much better educated than the majority. Her work as a pioneer nurse in Guam is an interesting story. She had been a bulwark of strength to the native nurses from the time the school was established and was a leader and adviser among the natives on this

little island. That Maria's great work is finished, because she has become a victim of leprosy, is a sorrow that is felt very keenly by the Medical Department of the Navy as well as her own people.

Native nurses, upon graduation, frequently become midwives. They locate in villages on different parts of the island, and not only are they required to keep in touch with Navy medical officers, but they are given a thorough examination yearly, to ascertain if they still have firmly implanted in their minds the rules of hygiene and asepsis which they have been taught. They are not permitted to deliver abnormal cases. These are reported to the medical officer who goes to the home or directs that the case be brought to the hospital.

Due to the fact that their work deals almost entirely with women and children, the native nurses are given very careful instruction in obstetrics and infant care and feeding. The Infant Welfare Department is very large, necessitating exacting supervision and careful teaching of preventive measures in the care of babies. The young woman who makes nursing her profession and life interest becomes a respected citizen of the island, and her word is accepted. It is largely through her example and influence that civilization and healthful living are promoted and sustained.

Senate Bill, No. 811—From California comes the news that the State Organization for Public Health Nursing is sponsoring a bill in the State Legislature which provides for a bureau of public health nursing within the organization of the California State Board of Health.

The nurses are urged to give the bill their unqualified support, as its passage will result in the following:

1. It will develop better nursing service for the public.
2. It will insure uniformity in public health standards throughout the state.
3. It will regulate the certification of all public health nurses.

Official representation within the State Department of Health; better correlation of public health nursing activities; the registering of all public health nurses in the state; the establishing of an official agency for the purpose of rendering assistance to health officers and welfare agencies; and last, but by no means least, a lively interest in the recruiting of student nurses to the public health field will be the activities of the proposed bureau.—*Pacific Coast Journal of Nursing*, Mar., 1927.

Teaching Nursing by the Application of the Case Study Method—The purpose of Professor Taylor's article is to point out the educational superiority of the case method as compared with the specialization method in teaching nurses nursing. One must appreciate the difference between the two methods in order to comprehend the author's suggestions of the possible effects of each on the patient and the student nurse. The specialization method favored by factories is often called the efficiency method because it is more economical of time and puts a premium on the output of work. Student nurses using this method specialize in procedures. Applied to a patient suffering from diabetes, this method would split up responsibility somewhat as follows: The treatment nurse might give the insulin, the enema, take the temperatures and do the charting; the second nurse would give the bath and make the bed, while the third served the diet, calculated and prepared by still another. There are two parties especially concerned here, the patient, and the student nurse. What is the effect on each? The author, who has had experience with both methods, expresses her opinion on the specialization method:

> If the efficiency with which a task is accomplished, and the appearance of the bed or ward is more important than the happiness or comfort of the patient, then we must be content with a machinery which turns out a product, and if the spirit of nursing is lacking to-day it is to some extent, at least, due to the demands on time and strength, the hurry, the routine, and the number of diffuse, exacting tasks which enter into a day's work in our busy hospital wards. This routine leaves no time for the nurse to live with the patients, or to participate in anything which concerns them except in their admission to the hospital—their beds—and finally their discharge, knowing not whence they came or whither they are returning.

In contrast to the specialization method which emphasizes skill in procedures, the case study method focuses itself on the individual patient as the center of interest. Each nurse is made entirely responsible for all nursing care of each of her patients. In the case of the patient with diabetes, it would mean that one student would plan the total nursing care, daily.

She would take the temperature, give the bath, administer the insulin, calculate and serve the diet, make the patient comfortable physically and mentally during her time on duty and make provision for it when she was not there, so long as the patient was assigned to her care. It is more consistent with the best standards of nursing because it emphasizes the patient for whom the whole hospital exists and for whose best care the nurses are getting their experience. It lends itself to 2 important phases of health education: one a study of the conditions which made the patient what he was when admitted, and another, an increased interest in improving the circumstances which affect his welfare after he is discharged. Therefore, it is more likely to attain the main objective of nursing education which the author states as "the preparation of the student to become a healthy, happy human being and to be a means of helping her patients to attain the same conditions of efficiency."—Effie Taylor, New Haven, Conn., *Internat. Council Nurses,* Jan., 1927.

Virginia's **Chair of Nursing**—"College work for Southern nurses in their own social environment will in the near future become a fact."

On October 15, 1926, the graduate nurses of Virginia presented to the University of Virginia a foundation for a Chair of Nursing to be called the Sadie Heath Cabinnis Department of Nursing, in honor of one of the pioneers of the nursing profession.

Undertaking to raise $50,000 was no easy task and the determination which characterized the leaders of the enterprise and the loyalty of their coworkers is laudable. The realization of the direct benefit to the daughters of Virginia remains for the future; the responsibility of providing the educational facilities rests with the university.—*Am. J. Nursing,* Jan., 1927.

Educating for Longer Life: Service Record of the Welfare Division, Metropolitan Life Insurance Company, 1909–1927. Published by the Metropolitan Life Insurance Company, New York—This concise report gives a graphic account of the work of the Metropolitan Life Insurance Company's Welfare Division from its inception in 1909 to 1927.

The aim of the Welfare Division's social program is the reduction of unnecessary illness and premature death among the policyholders who are largely the working population of this country, living and laboring under conditions which make for a higher death rate.

The methods used are: (1) education of the company's agents, and, through them, of its policyholders; (2) coöperation with community social and health agencies; (3) demonstrations and studies.

The results through education have made of the agents an army of health messengers bringing knowledge into the homes through literature consisting of the Metropolitan magazine and pamphlets which tell in a simple way the facts of hygiene, of communicable disease, the facts regarding well babies, appealing to the eye as well as by their word-content through gayly colored covers and pictures. In addition to the dissemination of health literature, the agents frequently assist in community health campaigns.

Through coöperation with existing nursing agencies, nursing service has been given to the industrial policyholders. In some instances, the company's own nursing personnel is used. That this nursing service has played a large part in the decline of mortality among industrial policyholders is evidenced by the fact that in a study recently completed it was demonstrated that the amount of public health nursing received by policyholders is a distinct index of the amount of decline in industrial mortality. Carrying on this work through coöperation with existing agencies avoids duplication and strengthens the agencies. National and State Nursing Bureaus and organizations have been assisted by financing studies in uniform systems of accounting and in uniform systems of recording.

Far-reaching results have come from demonstrations made by the Metropolitan Life Insurance Company. One in Framingham, Massachusetts, coöperating with the National Tuberculosis Association, showed at the end of 7 years that a death rate from tuberculosis which had averaged 121 per 100,000 had dropped to 38 per 100,000. The infant death rate in the Thetford mines in the province of Quebec was reduced at the end of a 3-year demonstration from 300 per 1,000 to 96 per 1,000.

A graph of the comparative study of all causes of death among industrial policyholders in the United States registration area reveals that in 1911 the death rate among these policyholders was considerably higher than in the general United States registration area, while in 1925 the death rate among these policyholders was slightly lower than that in the United States registration area.

Health films have been prepared and used at county fairs and public gatherings.

Many social and health workers are looking forward to the result of the Cost of Burial Study, for often have they seen families who have hesitated in purchasing needed articles for their children but who have not hesitated at a costly funeral.

A program such as this conveys with the word "insurance" not only that picture which is so frequently seen among leaflets urging the necessity for life insurance—a family retaining its economic independence though the wage-earner has died—but a new picture where "educating for longer life" has prevented the premature loss of the wage-earners and improved and maintained the health of all members of the family. That this is mutually beneficial we know from repeated statements from the Welfare Division of the company that health work pays.

Is There a Nursing Shortage?—Residents of Massachusetts, New York, Pennsylvania, Georgia, Louisiana, Illinois, Kansas, Wyoming, Washington or California may receive one of the questionnaires sent out by the Committee on the Grading of Nursing Schools. This is an effort to get at the truth concerning the supply of, and the demand for, nurses.

A frank expression of opinion from each recipient of the questionnaire is urgently requested by the Committee on Grading. Much of the success of this enterprise will depend upon the thoughtful personal consideration of the problem given by each individual receiving the questionnaire.

Partners in Health Work—Since rural public health nurses do their most intensive work for the correction of defects in the spring and early summer, an article in the March 1 *Red Cross Courier*, entitled, "The Place of the Chapter Volunteer in a Rural Public Health Nursing Program," is particularly timely, especially as it points out a source of real help for the overburdened nurse. Katherine Faville, who wrote the article, has been nursing field representative for the American Red Cross in West Virginia, Kentucky and Indiana, and so has drawn her observations from a variety of small town and rural county services. She has found that permanent results in rural communities can best be obtained by nurses who can be *partners* in a program as well as leaders. The nurse carries that part of the work for which her professional training fits her and the lay, volunteer group relieves her of every other detail possible.

The article describes dental clinics, tonsil and adenoid clinics and child welfare conferences for which volunteers have assumed full responsibility, other than that for the home visits and follow-up work. Several committees which were organized to help the nurse meet the needs of the socially unfit in the community have realized their incompetence to meet the more complex problems and so have formed study groups with skilled family case workers to lead their discussions. In other towns the most conspicuous waste was in the use of the nurse's time for transportation purposes. They have abolished the luxury of the nurse-chauffeur and have substituted a volunteer motor corps.

Very often it requires unusual vision and patience for a nurse to balance the occasional friction and inefficiencies of a volunteer service with the ultimate benefits to the community in an awakened lay conscience. Nevertheless, most would agree with Miss Faville's conclusion:

> The cultivation of volunteer help has come to be regarded as sound business which trained health workers cannot afford to disregard—since it is a means of increasing the actual amount of work accomplished, of creating better public understanding and consequent support, and of bringing home to the individual the personal meaning and responsibility of positive health.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B.

NOW that the Sixty-ninth Congress has has passed into history and obscurity, a brief review of the small amount of public health legislation considered by it, and the large amount that was not, may be of interest to sanitarians.

Public Health in the Sixty-ninth Congress—Out of about 25,000 bills and resolutions introduced in both houses during the two sessions, which began in December, 1925, and ended on March 4, 1927, only about 150 measures were of direct significance to public health. Most of these were not acted upon, for this Congress passed only four laws of any real importance to national vitality. These were: an act to safeguard the distribution and sale of dangerous caustic and corrosive substances in interstate and foreign commerce; the milk importation act; the act for a 2 year extension of the Federal Maternity and Infancy Law; and an act authorizing an appropriation for the Gorgas Memorial Institute of Tropical and Preventive Medicine in Panama.

The Milk Importation and Maternity and Infancy Acts have been frequently discussed in previous issues of the JOURNAL. A last minute appropriation for the continued operation of the latter act was jammed through, so that this work will not be curtailed during 1927–1928. The new Federal Caustic Poison Act, which had been indorsed by the A.P.H.A., defines "dangerous caustic and corrosive substances," and requires that they may be labeled as poisons and that directions for emergency treatment appear on the containers. The act will be administered by the Secretary of Agriculture, but will not be put into operation until 6 months after it was signed on March 3.

Among the less important measures adopted were acts to continue hospitalization for certain veterans at Liberty, N. Y., and Saranac, N. Y.; an act for payments for blood transfusions in government hospitals; an act authorizing payment of expenses of delegates to a Pan-American Sanitary Conference at Lima, Peru; and several minor acts not even worth mention. Failure of the usual anti-vivisection bill and of a dangerous bill relating to medical practice in the District of Columbia are also positive achievements, as was the lack of action on a proposal to strengthen the Harrison Narcotic Law, though this last was more of a medical than a public health measure.

A number of bills passed the House, but were blocked by the filibustering tactics in the Senate. Among these were the plan for the manufacture of medicinal liquor and the proposal for additional hospital facilities for veterans. Among the public health bills upon which no final action was taken were those for correlation of federal health activities; for a national institute of health; authorizing a five million dollar reward for a cancer cure; for the national control of narcotics; for a commissioned status for the sanitary engineers of the Public Health Service, authorizing this Service to give special advice on sanitary engineering; granting a commission as colonel to the President's physician; for the control of oil pollution of navigable streams; and for a system of school hygiene in the District of Columbia. At the last moment a bill for the repeal of the act creating the Children's Bureau was introduced, but died with the expiration of Congress.

The Seventieth Congress, with many new members, will convene on the first Monday of December, 1927. All legislation, no matter how far it did or did not get in the last Congress, will have to start all over again. The bill for the coördination of federal health activities is one item which will certainly be reintroduced. The report of the hearings on this bill have been issued and may be obtained from the clerk of the Committee on Interstate and Foreign Commerce, House Office Building, Washington, D. C. This report will make interesting and instructive reading for any sanitarian.

Wisdom in the Appendices—The regular pages of that recondite journal, the *Congressional Record*, being inadequate to contain all of the wisdom which emanates from that intellectual body, the Congress of the United

States, special appendices have to be issued. In that of March 9, published 5 days after Congress had adjourned, may be found essays on the iniquity of imported milk regulation, by Senator King; on the incompetency of existing Indian affairs administration, by Representative Frear; and a blurb entitled "Excelsior Springs, Mo., Nature's Health Resort" by Representative Milligan. This issue also has a really scholarly article on a Federal Department of Public Works, by Representative Wyant, who, incidentally, was one of the sub-committee which held the hearings on federal health correlation.

In the Appendix to the *Record* for March 14 the Honorable Mr. Blanton devotes 87 pages to a somewhat vitriolic discussion of Mr. Fenning, former commissioner of the District of Columbia, at whose attorney Mr. Blanton once heaved an inkwell. He also says some unpleasant things about St. Elizabeth's, the government hospital for the insane, and its superintendent. This extension of remarks is said to have cost the government over $3,000. Is it worth it?

Nuisance Abatement—A discussion of nuisances in general, including those which affect health, is contained in an 8-page pamphlet issued by the League of Minnesota Municipalities (Publication No. 11, price 10 cents). This bulletin, by Harvey Walker, is a succinct legal treatise, with many citations to court decisions, especially those applicable to conditions in Minnesota. Nuisances are discussed from the standpoint of their classification, definition, abatement, enforcement of ordinances, and liability. A suggested nuisance ordinance is included for local adoption. The pamphlet is reprinted for the State Board of Health, which is said to have approved the ordinance proposed and recommended its adoption.

This same League also has a pamphlet on garbage and refuse disposal for small municipalities, which includes a suggested ordinance. The league has headquarters at the University of Minnesota Library, Minneapolis.

Opposition to Public Health—Speaking of nuisances, we have received from a California health officer a copy of a letter sent by an organization calling itself the "Public School Protective League" to the Superintendent of Schools of Riverside. It protests against an immunization campaign now being conducted in the schools, and declares that there is no law which authorizes schools to permit outside agencies to enter and try to popularize any kind of treatment. It also declares many other things, none of them of any significance. Immunization is, of course, not treatment, but a necessary preventive measure, essential to the promotion of public health. The health officer has a perfect right to employ proper educational measures to induce parents to have their children immunized; though he should not inoculate or have inoculated any whose parents refuse to consent in writing. No court will restrain such action, provided it is made clear that the procedure is supported by the consensus of scientific and professional opinion. The American Association for Medical Progress at 370 Seventh Avenue, New York City, is one organization which is prepared to supply ammunition to those who want to combat these antis. The best method, however, is to ignore their ravings and go ahead with sane and practical measures for public health.

Tuberculosis Legislation—A comprehensive study of state health department supervision in the control of tuberculosis, made by Dr. Robert E. Plunkett, has been issued by the National Tuberculosis Association of New York City. This valuable material, compiled from answers to the inevitable questionnaire, includes information as to the legislation in effect and its enforcement, though actual citations to the laws are not given.

A tuberculosis legislation manual is also now being developed for the National Tuberculosis Association by the associate editor, who would be pleased to receive suggestions concerning it. This manual will contain an outline of desirable state legislation against tuberculosis, an analysis and comment on existing laws, an index of all the statutes on this subject, and other useful information. It will be fully annotated and ought to be available about the first of next year.

County Health Work—A survey of state laws relative to provisions for county health work has been made by Dr. James Wallace, Deputy Commissioner of Health of Iowa, and the results have been published in the *Nation's Health* for March, 1927. Dr. Wallace collected his information by questionnaire, as is customary, and relates the rather remarkable fact that he received answers from every state. A questionnaire is not the most accurate way to secure information on legislation, but it often does produce valuable information, and Dr.

Wallace's study is well worth while in indicating the extent and scope of county health work.

According to this investigation, 30 states now have legal provisions for county boards of health, though in 2 instances, in California and Maine, the law is for district boards, which may, however, be organized on county lines. In 3 other states, partial provision has been made for such county boards. Four other states, while having no provision for the boards, have, nevertheless, legally established county health officers. In a few other states such officers are at work, in spite of the absence of definite legal authorization. Thus, two-thirds of the states have laws for county health work and in 85 per cent of them county organizations for public health are actually in operation.

Seven excellent reasons for the existence of a county board of health are given by Dr. Wallace and he has also compiled a table showing by states whether there is legal provision, how the board is composed, whether there is provision for a health unit, and if it is operating.

Stream **Pollution Again**—A municipality is just as much liable for the maintenance of a nuisance as is an individual. This principle has often been upheld by the courts, especially with respect to stream pollution. In South Dakota the Supreme Court has recently held in Gillert vs. City of Madison, 210 N. W. 978, that a city was liable for consequential damages due to discharge of sewage into a stream, even where no negligence is proved. The city of Buffalo has recently been sued for $775,000 for damages caused by its pollution of the Niagara River by sewage, according to an item in *New York Health News* for March 7, 1927. The functions of the State Water Commission of Connecticut, established by a law of 1925, to guard streams against excessive pollution, are outlined in *Water Works Engineering* for February 2, 1927, by T. F. Maguer.

Standard **Milk Ordinance Results**—An increase in the consumption of market milk, as well as improvements in the quality of all milk supplies are cited as among the highly satisfactory results from the adoption and enforcement of the standard milk ordinance in 14 towns in Alabama. These results are set forth in an interesting paper contributed to the March 11, 1927, issue of *Public Health Reports* by Leslie C. Frank, S. W. Welch, and C. A. Abele. Each of the 14 communities is located in a county having a full-time county health unit, each of which employs a sanitary inspector, who usually concerns himself with milk inspection as well as other duties. This inspector performs the necessary enforcement duties.

Workmen's Compensation Legislation—The U. S. Bureau of Labor Statistics has issued a new bulletin (No. 423), which reviews all workmen's compensation legislation in this country and Canada up to the end of 1926. The entire Canadian area and all but 5 of our states and the District of Columbia are now covered by such laws.

Typhoid fever incurred by an employe while on a business trip for his company has been held as not compensable under the workmen's compensation act of California in Pattiani vs. State Industrial Accident Commission, 250 Pac. 864. A salesman from California ate oysters in New York during the typhoid epidemic there and the ruling of the court was virtually to the effect that he ought to have known better. At least, there was no connection between this rash act and his employment.

In addition to its 700-page bulletin on workmen's compensation, the U. S. Bureau of Labor Statistics has issued a new pamphlet (No. 425) giving the latest statistics on industrial accidents. Three federal agencies, the Bureau of Mines, and the Interstate Commerce Commission, in addition to the Bureau of Labor Statistics collect such data.

Miscellaneous Items—A real estate company in Ossining, N. Y., has been trying to enjoin the establishment of a hospital for tuberculosis patients, according to an item in the *New York Tribune*, March 18, 1927. The judge is said to have indicated lack of sympathy with this mercenary attempt, saying, "You have to put consumptives somewhere." Except in Michigan, courts have consistently refused to enjoin the erection of tuberculosis hospitals. The associate editor has been asked to prepare an article on tuberculosis and the courts for the *Journal of Outdoor Life*, in which this matter will be discussed at greater length.

An excellent review of medical legislation in the Sixty-ninth Congress appears in the *Journal of the American Medical Association* for March 19, 1927.

CONFERENCES

May 9-11, American Child Health Association; Washington, D. C.

May 10-12, Medical Society of the State of New York; Niagara Falls, N. Y.

May 11-18, National Conference of Social Work; Des Moines, Iowa

May 14-16, Conference of State & Provincial Health Authorities of North America; Washington, D. C.

May 16-20, American Medical Association; Washington, D. C.

May 23-28, National Tuberculosis Association; Indianapolis, Ind.

June 2-3, New Mexico Public Health Association; Taos, N. M.

June 3 (week), Canadian Tuberculosis Association; Ottawa, Canada.

June 4-6, Conference of State Sanitary Engineers; Chicago, Ill.

June 6-11, American Water Works Association; Chicago, Ill.

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